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Haywood Electrical Membership Corporation Herbicide Right-of-Way Maintenance Project

Environmental Assessment

Nantahala Ranger District, Nantahala National Forest & Pisgah Ranger District, Pisgah National Forest

Buncombe, Haywood, Jackson, Macon, and Transylvania Counties, North Carolina

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1.0 INTRODUCTION

1.1 PURPOSE AND OBJECTIVES OF THE ENVIRONMENTAL ASSESSMENT

The purpose of this Environmental Assessment is to ensure that the US Forest Service (USFS) is in compliance with various laws [e.g., Federal Land Policy and Management Act (P.L. 94-579, 90 Stat. 2743) and Nantahala-Pisgah Land and Resource Management Plan (1987, as amended) hereinafter referred to as the Forest Plan] regarding threatened, endangered, and sensitive species and to ensure maintenance of species viability for federally threatened, endangered, and sensitive (TES) species. This PA and BE focus on the potential effects of proposed activities that would most likely affect wildlife, aquatic and botanical resources. These analyses have been prepared based on the best information presently available.

1.2 PURPOSE AND NEED OF THE PROPOSAL

The purpose of this proposal is to evaluate selective herbicide application in conjunction with mechanical trimming for power line right-of-way maintenance across National Forest System (NFS) lands. Haywood Electrical Membership Corporation (EMC) has a Special Use permit for approximately 60 miles of right-of-way within the Pisgah and Nantahala National Forests and 6 miles within the Sumter National Forest in South Carolina. All of the right-of-way on NFS lands is currently maintained solely by mechanical methods, at considerable cost to Haywood EMC customers. By using a combination of mechanical trimming and herbicide application, the frequency of mechanical trimming can be decreased, thereby lowering costs associated with right-of-way maintenance on NFS lands.

Haywood EMC is a member-owned electric utility serving members in Haywood, Buncombe, Macon, Jackson, and Transylvania Counties in North Carolina; Oconee County in South Carolina; and Rabun County in Georgia. The Cooperative's service area contains some of the most rugged, mountainous terrain in the state involving more than 2,671 miles of power lines; thus, the cost of providing electric service is more costly here, especially right-of-way clearing and maintenance.

On private land Haywood EMC mechanically trims vegetation, and then selectively sprays herbicide to help reduce growth, thereby reducing the number of trips required to mechanically trim. By including NFS lands in this program, Haywood EMC will be able to continue to economically supply the most reliable power to its members while providing as safe an area around power lines as possible.

This project includes the use of selective herbicide application in conjunction with mechanical trimming for right-of-way maintenance across NFS lands. Utilities are required to manage these rights-of-way in an environmentally sound manner that does not adversely impact other National Forest resources such as water quality, wildlife habitat, visual quality, and public recreation. In addition to the economic benefits of selective, low-volume herbicide application in right-of-way maintenance, there are clear benefits to wildlife habitat. Following selective, low-volume herbicide application, plant species assemblages tend to shift toward wildflowers, grasses, forbs, vines, and brambles (such as blackberry) and away from the low-diversity, high-density, brushy regeneration of common hardwood species characteristic of repeated mechanical trimming programs. Selective herbicide application is consistent with the direction of the Forest Plan to give priority to special use requests that contribute to public safety and welfare, such as public utility rights-of-way (Forest Plan, page III-44).

1.3 PROPOSAL

The Nantahala-Pisgah National Forests propose the issuance of an herbicide spraying permit to Haywood EMC. The permit would allow Haywood EMC to use selective, low-volume herbicide application in conjunction with mechanical trimming in the maintenance of approximately 60 miles of powerline right-of-way on NFS lands in western North Carolina.

1.3.1 POSSIBLE ALTERNATIVES

This document analyzes effects of alternatives for vegetation management on powerline rights-of-way on NFS lands within the Haywood EMC service area. These alternatives are (A) No Action; (B) Foliar Habitat/Accord Application with as-needed Basal/Cut Stump Retreatment; (C) Foliar Arsenal/Krenite Application with as-needed Basal/Cut Stump Retreatment; and (D) Basal/Cut Stump Only Application. The vegetation management alternatives are outlined below:

Alternative A - No Action

Alternative A was developed to address concerns over the use of herbicides. This alternative would be the status quo, which is to continue maintaining powerline rights-of-way on NFS lands via mechanical trimming on a 5-year rotation.

Alternative B - Foliar Habitat/Accord Application with Basal/Cut Stump Retreatment

Alternative B includes initial mechanical trimming of woody vegetation. Regenerating woody vegetation would be treated with foliar application of Habitat (Imazapyr) and Accord (Glyphosate) during summer. Retreatment during winter with basal and/or cut-stump application of Garlon 4 (Triclopyr) and Stalker (Imazapyr) could also be used on an as-needed basis. However, basal and/or cut-stump retreatment is often not necessary in instances where selective, low volume foliar herbicide application achieves the desired vegetation management results. Consistent with the Forest Plan, no herbicide application will occur within 100 feet on either side of perennial streams or lakes, or within 30 feet of perennial streams when the riparian area has been delineated on the ground per USFS guidelines. Although no aquatic herbicide application will occur under this project, both Habitat and Accord are approved for aquatic application; this measure further insures that any aquatic resources within the project area will not be impacted by the proposed action. Due to this alternative's desirable effects to the vegetative community within the powerline rights-of-way, reduction of ground-disturbing activity within the project area, reduction of costs associated with right-of-way maintenance, and high safety margin to aquatic resources in the project area. ***Alternative B is the Preferred Alternative***

Alternative C - Foliar Arsenal/Krenite Application with Basal/Cut Stump Retreatment

Alternative C includes initial mechanical trimming of woody vegetation. Regenerating woody vegetation would be treated with foliar application of Arsenal (Imazapyr) and Krenite (Fosamine ammonium) during summer. Retreatment during winter with basal and/or cut-stump application of Garlon 4 (Triclopyr) and Stalker (Imazapyr) could also be used on an as-needed basis. However, basal and/or cut-stump retreatment is often not necessary in instances where selective, low volume foliar herbicide application achieves the desired vegetation management results. Consistent with the Forest Plan, no herbicide application will occur within 100 feet on either side of perennial streams or lakes, or within 30 feet of perennial streams when the riparian area has been delineated on the ground per USFS guidelines.

Alternative D – Basal/Cut Stump Application and Retreatment

Alternative D includes initial mechanical trimming of woody vegetation, followed by cut-stump application of Garlon 4 (Triclopyr) and Stalker (Imazapyr). Regenerating woody vegetation would be treated with basal and/or cut-stump application of Garlon 4 (Triclopyr) and Stalker (Imazapyr) would also be used on an as-needed basis. Consistent with the Forest Plan, no herbicide application will occur within 100 feet on either side of perennial streams or lakes, or within 30 feet of perennial streams when the riparian area has been delineated on the ground per USFS guidelines. *Alternative D was not considered in detail, as it was determined that this method was not feasible due to greatly increased costs and marginal benefit over Alternative A, which is the current vegetation management protocol.*

1.3.2 MEASURES COMMON TO ALL ACTION ALTERNATIVES

To protect potentially rare species habitats and sensitive aquatic and terrestrial communities, several sections of powerline right-of-way were omitted from consideration for herbicide application under the action alternatives (Alternatives B and C). In addition to the riparian buffers described above, portions of right-of-way segments 2, 29, and 39 have been eliminated from consideration for herbicide application. Segments 17, 26, and 30 were also omitted from consideration for herbicide application due to the presence of perennial streams within 100 feet of much of the segment length. Under any of the action alternatives, a total of 5.35 linear miles of powerline right-of-way will be excluded from consideration for herbicide application.

Only hardwood tree species capable of interfering with the powerlines are treated under any of the current or proposed vegetation management alternatives. Shrub species, including mountain laurel, rhododendron, witch hazel and alder species are not typically treated. Individual stems of these shrub species are subject to manual trimming only when it is necessary to cut a small path through impenetrable thickets for worker access. Additional mitigation measures are addressed in section 10.0 of this document.

1.3.3 HERBICIDES TO BE USED

Six herbicides are included in the alternatives listed above in Section 1.3.1 above. The active ingredients in each of these herbicides are routinely used in right-of-way maintenance programs, and are included in the list of approved herbicides included in the USFS Vegetation Management Environmental Impact Statement and subsequent revisions. The six proposed herbicides are approved for use on non-crop areas, including rights-of-way, pasture/rangeland, wildlife openings, recreational areas, and industrial sites. Material Safety Data Sheets (MSDS) for each herbicide are included in Appendix A (available online at: http://www.cs.unca.edu/nfsnc/nepa/nepa.htm). Each is discussed below:

Arsenal®, Habitat®, and Stalker® are produced by the BASF Corporation and contain the active ingredient Imazapyr. These herbicides do not contain heavy metals, organochlorides (organic compound containing a heavy chlorine compound) or phosphates (inorganic salt of phosphoric acid). Arsenal® is formulated for foliar application of unwanted plant species; Habitat® is formulated for foliar application and is approved for aquatic sites; whereas Stalker® is formulated for basal application. Imazapyr kills plants by inhibiting an enzyme that is necessary for protein production; this enzyme is not found in animals. The EPA classifies Imazapyr as a Category IV pesticide ("Practically Nontoxic") by oral exposure and inhalation; it is considered a Category III pesticide ("Slightly toxic") via dermal exposure. It is also considered a Group E compound, indicating that it shows no evidence of carcinogenicity. Field tests indicate that Arsenal® is somewhat active in the soil, but binds tightly with soil particles and does not move significantly in the soil, either vertically or laterally (BASF 2001, VMEIS 1989).

Accord® is produced by Dow AgroSciences and contains the active ingredient Glyphosate. This herbicide is formulated for foliar application of unwanted plant species and is approved for use on aquatic sites; it acts by inhibiting amino acid metabolism. The EPA classifies Accord® as a Category IV pesticide ("Practically Nontoxic") by oral and dermal exposure; toxicity via inhalation was not evaluated, as Glyphosate was considered non-volatile. It is also considered a Group E compound, indicating that it shows no evidence of carcinogenicity. Accord® displays minimal activity and minimal mobility in the soil (EPA 1993, VMEIS 1989).

Garlon® 4 is produced by Dow AgroSciences and contains the active ingredient Triclopyr. Garlon® 4 will be used for low-volume basal and/or cut-stump application of unwanted plant species in this instance. The EPA classifies Triclopyr as a category III pesticide ("Slightly Toxic") by oral and dermal routes; no information on toxicity via inhalation is available. It is also considered a Group D compound, indicating that it is not classifiable as to human carcinogenicity. Garlon® 4 has minimal activity and limited mobility in the soil; it binds tightly with organic material and clay particles (Dow AgroSciences 2003, VMEIS 1989).

Krenite® is produced by DuPont and contains the active ingredient Fosamine Ammonium. This herbicide is formulated for foliar application of unwanted plant species; it acts by inhibiting bud formation in the spring following application. The EPA classifies Krenite® as a category IV pesticide ("Practically Nontoxic") by oral and dermal exposure, and by inhalation. It is also considered a Group E compound, indicating that it shows no evidence of carcinogenicity. Krenite® displays minimal activity and minimal mobility in the soil; it is adsorbed by soil particles and is decomposed quickly by soil microorganisms (DuPont 2003, VMEIS 1989).

2.0 PROJECT LOCATION AND EXISTING CONDITIONS

2.1 LOCATION AND DESCRIPTION OF PROJECT AREA

The project and analysis areas lie throughout portions of the Nantahala-Pisgah National Forests in North Carolina. For ease of identification, the portions of powerline right-of-way included in the project have been divided into segments, identified by number, and described in Section 2.2.2 below. Maps of these segments are included in Appendix B (available online at: http://www.cs.unca.edu/nfsnc/nepa/nepa.htm). The right-of-way segments are located in the following counties with the number of segments listed in parentheses: Buncombe (2), Haywood (6), Jackson (12), Macon (12), and Transylvania (8). The 40 segments of powerline right-of-way included in this project range from approximately 2,300 feet to 5,500 feet in elevation. The majority of the right-of-way segments either follow existing public roads or are less than 1 mile in length. All of the rights-of-way included in this project are existing (presently cleared) rights-of-way; no new rights-of-way are included in this project.

2.2 EXISTING CONDITION

The specific areas under consideration have been maintained as powerline rights-of-way for as long as 35 years and have been subject to mechanical trimming to control vegetation, typically on a 5-year rotation. Rights-of-way on adjacent private lands have been subject to a vegetation control program which utilizes foliar and basal herbicide treatments every 3 years, with infrequent mechanical trimming on an as-needed basis. As is the common result of mechanical vegetation management, vegetation within the rights-of-way on NFS lands within the project area consists primarily of thick regeneration of hardwoods, patches of dense rhododendron and/or mountain laurel (depending on the site), and relatively limited herbaceous

growth under the dense woody regeneration. Mechanical trimming also results in a layer of woody debris on the powerline right-of-way, which makes pedestrian access more difficult and reduces the amount of herbaceous ground cover within the right-of-way.

Appendix B contains topographic maps showing each segment and the surrounding areas and Appendix C contains representative photographs of the right-of-way segments (available online at: http://www.cs.unca.edu/nfsnc/nepa/nepa.htm). This project covers landscapes including a wide variety of natural communities, general ownership patterns, and disturbance histories. These areas were historically forested, but have been heavily modified over the past 35 years due to powerline right-of-way establishment and maintenance. None of the rights-of-way included in this project are currently forested; forested stands typically occur adjacent to the rights-of-way. Table 1 lists the community types and frequency within 200 meters of the powerline rights-of-way included in this project; Table 2 lists the age classes and frequency within this same 200 meter area. The major vegetative community types adjacent to each right-of-way segment were classified following Schafale and Weakley's *Classification of the Natural Communities of North Carolina* (1990), with the exception of the Oak-Rhododendron community type and Dry-Mesic Oak Heath community type which are currently used by USFS botanists. Forest community types adjacent to the rights-of-way encountered in this project are described in Section 2.2.1 below. The individual segments are discussed in Section 2.2.2 below.

Table 1. Community types present within 200 meters of the powerline rights-of-way included in this project

Community Type	Frequency
Acidic Cove	31%
Chestnut Oak	1%
Dry Mesic Oak Heath	5%
High Elevation Red Oak	7%
Montane Alluvial	<1%
Montane Oak-Hickory	48%
Oak-Rhododendron	3%
Pine-Oak Heath	<1%
Rich Cove Forest	4%

Table 2. Age classes of adjacent community types present within 200 meters of the powerline rights-of-way included in this project.

Age Class (years)	Frequency
0-10	<1%
11-20	2%
21-40	6%
41-60	5%
61-80	28%
81-100	51%
100+	7%
No age data available	<1%

2.2.1 Terrestrial Environment

Acidic Cove forest occurs on moist, acidic soils, usually on steep slopes adjacent to mountain streams. The overstory includes hemlock, birch, red maple, tulip poplar, and red oak. Witch hazel is common in the understory, and rhododendron and doghobble are the most common shrubs. The herb layer is sparse and is usually limited to a few species.

Chestnut Oak forest occurs on slopes and ridgetops at low to moderate montane elevations. These forests are in a state of transition following the loss of chestnut as the dominant canopy species. The overstory is typically dominated by chestnut oak and scarlet oak, with lesser amounts of other oaks, hickories, pines, hemlock, and red maple. The understory may contain sourwood, red maple, and sassafras; mountain laurel and rhododendron, or vaccinium species may be common in the shrub layer. The herb layer is highly variable, depending on density of the shrub layer above.

Dry Mesic Oak Heath is found primarily at lower elevations near the Blue Ridge escarpment in areas with higher dormant season rainfall. This forest type includes dry and dry mesic mixed oak and oak-hickory forests. Common tree species include scarlet oak, northern red oak, white oak, blackgum, flowering dogwood, white pine and sourwood. Common species in the shrub layer include bear huckleberry, mountain laurel, giant cane, hillside blueberry. Heath family members dominate the generally dense mixed deciduous evergreen shrub layer. Herb diversity is sparse within this forest type.

High Elevation Red Oak forest occurs on moderately dry slopes and ridgetops at mid to high elevations. The overstory is dominated by northern red oak; white oaks and hickories are essentially absent. Other overstory trees may include chestnut oak, red maple, and tulip poplar. American chestnut, serviceberry, maples, hawthorn, and holly are common understory species. The shrub layer often contains rhododendron, vaccinium, witch hazel, and mountain laurel. Herbs may be moderate to dense, but fairly low in diversity.

Montane Alluvial forest is found on stream and river floodplains at moderate to high elevations on alluvial soils. The canopy contains a mixture of bottomland and mesophytic tree species, such as Canada hemlock, sycamore, yellow birch, white oak, red maple, yellow poplar, and river birch. American hornbeam, witch hazel, and black willow are common in the understory. The shrub layer is composed of rhododendron, hazel alder, and doghobble. The herb layer is quite variable, depending on the site.

Montane Oak-Hickory forest occurs on moderately warm upper and middle slopes, especially gently convex slopes at moderate elevations. The canopy is dominated by a mixture of oaks, including white oak, chestnut oak, red oak, black oak, along with pignut hickory. Sourwood, black gum, and red maple are common in the understory. Flame azalea, mountain laurel, and American chestnut are common shrubs, along with some vaccinium species. The herb layer in this forest is highly variable, depending on the site characteristics.

Oak-Rhododendron forest generally occur upslope of Acidic Cove forest on north-facing slopes. It is most similar to Acidic Cove forest, but differs in that it is dominated by northern red oak and chestnut oak; subdominants include tulip poplar, black gum, buckeye, and silverbell. The rhododendron and witch hazel dominate the shrub layer. The herb layer is very sparse in this community type.

Pine-Oak Heath forest is found on exposed sharp ridges, knobs, low elevation peaks, and steep south slopes. The canopy can range from open to nearly closed, and is dominated by combinations of Virginia pine, pitch pine, Table Mountain pine, and scarlet oak. Other overstory or understory tree species may include chestnut oak, chestnut, chinquapin, sassafras, blackgum, red maple, hemlock, and sourwood. The shrub layer is often dense, containing ericaceous species such as mountain laurel, vaccinium species, and

gaylussacia species. The herb layer may include trailing arbutus, pipsissewa, galax, goat's rue and turkeybeard.

Rich Cove forest occurs on moist lower to middle slopes, particularly concave slopes at low to moderate elevations. It can sometimes extend to the top of the ridge on sheltered slopes. It is often characterized by the co-dominance of tulip poplar, basswood, sugar maple, and Carolina silverbell. Sweet birch, beech, yellow buckeye, red maple, white ash, and cucumber magnolia may also be present. Striped maple and hop-hornbeam are common additions to the understory; the shrub layer is often dominated by hydrangea. The herb layer in this forest type is typically thick, lush, and is the most diverse of the vegetative communities in the project area.

2.2.2 RIGHT-OF-WAY SEGMENT DESCRIPTIONS

Much of **Segment #1** follows Charley's Creek Road (SR #1756), with a southward spur at the intersection of Wolf Mountain Road in Jackson County. Segment #1 crosses forest communities including elements of High Elevation Red Oak, Acidic Cove, and Montane Oak-Hickory forest communities at an elevation of approximately 4,000 feet. One perennial stream crosses this segment of right-of-way.

Segment #2 also follows Charley's Creek Road (SR #1756) near Balsam Lake; a small spur services Balsam Lodge at the southern portion of the segment, and another spur is located at the northern end, extending northwest, away from Charley's Creek Road in Jackson County. Segment #2 is located at an elevation of approximately 3,500 feet and crosses forest communities best described as High Elevation Red Oak / Montane Oak-Hickory forest on the ridgetops. It transitions into Rich Cove communities in drainages and other more mesic areas. The central portion of this segment crosses streams and backwater areas of Balsam Lake in three areas, and follows the edge of the lake closely between these areas. Due to the presence of managed brook trout waters (Wolf Creek) in close proximity to the northern section of this segment, no herbicide application will occur on the northern 3,300 feet of Segment #2, or on the 1700' northwestern spur along Gage Branch.

Except where the right-of-way crosses drainages, much of **Segment #2a** closely follows Charley's Creek Road (SR #1756) in Jackson County. This segment is located at an elevation of approximately 3,600 feet and crosses High Elevation Red Oak forest communities. One perennial stream crosses this segment of right-of-way.

Segment #3 follows Charley's Creek Road (SR #1756) where it crosses Parker Gap in Jackson County. This segment is located at an elevation of approximately 3,900 feet and crosses High Elevation Red Oak forest communities on ridges and Acidic Cove communities in drainages. Two perennial streams cross this segment of right-of-way.

Segment #4 is located at an elevation of 3800 feet and follows Broom Road (SR #1766) in Jackson County. Segment #4 primarily includes High Elevation Red Oak forest communities, with a fairly large white pine stand in the drainage. One perennial stream crosses this segment of right-of-way.

Segment #5 follows Johns Creek Road (SR #1747) in Jackson County at an elevation of 3,100 feet. This short segment primarily includes the Rich Cove forest type. No streams cross this segment of right-of-way.

Segment #6 is located at an elevation of 3,400 feet and follows Tanasee Creek Road (SR #1762) in Jackson County. Most of the segment is located along the road shoulder; adjacent forest can best be described as an Acidic Cove forest community. No streams cross the right of way.

Segment #7 is located at an elevation of 3,100 feet and follows NC Highway 281 in Jackson County. This segment is located over or near the road shoulder throughout. Adjacent forest is of the Montane Oak-Hickory forest community type. One perennial stream crosses this segment of right-of-way.

Segment #8 is located at an elevation of 3,900 feet. This segment follows Rock Bridge Road (SR #1140) in Jackson County. Segment #8 crosses Montane Oak-Hickory forest communities on ridges and Acidic Cove communities in drainages. Three perennial streams cross this segment of right-of-way.

Segment #9 is located at an elevation of 4,700 feet. This segment is located immediately adjacent to Tower Road, which ascends to the summit of Toxaway Mountain in Jackson County. The forest community along this segment is best described as Montane Oak-Hickory. No streams cross this segment of right-of-way.

Segment #10 is located at an elevation of 4,300 feet. This segment is located immediately adjacent to Fox Run Ridge Road on Hogback Mountain in Jackson County. The forest community along this segment is Montane Oak-Hickory. No streams cross this segment of right-of-way.

Segment #11 is located at an elevation of 3,400 feet. This segment follows a gravel road off Upper Whitewater Church Road in Transylvania County. The forest community along this segment generally conforms to the Acidic Cove forest type. Two perennial streams cross this segment of right-of-way.

Segment #12 is located at an elevation of 3,500 feet. This segment follows Found Forest Road off of Highway 107 in Jackson County. The forest community along this segment is classified as Acidic Cove forest. One perennial stream crosses this segment of right-of-way.

Segment #13 is located at an elevation of 2,900 feet. This segment follows Walkingstick Road in Macon County. Segment #13 crosses Acidic Cove forest; one perennial stream crosses at the northern end of this segment of right-of-way.

Segment #14 is located at an elevation of 3,000 feet. This segment begins at Rich Gap road in Macon County and continues to the northeast. Segment #14 primarily crosses Acidic Cove forest interspersed with white pine stands and some areas of Montane Oak-Hickory forest on the ridgetops. Two perennial streams cross this segment of right-of-way.

Segment #15 is located at an elevation of 2,900 feet. This segment begins at NC Highway 28 in Macon County and continues to the west through High Elevation Red Oak forest. No streams cross this segment of right-of-way.

Segment #16 is located at an elevation of 3,500 feet. This segment begins at Clear Creek Road in Macon County and continues to the south, through Montane Oak-Hickory and Acidic Cove forest. No streams cross this segment of right-of-way.

Segment #17 is located at an elevation of 3,000 feet. This segment is a continuation of Segment #16 in Macon County and continues to the south through Montane Oak-Hickory and Acidic Cove forest. The length of this short segment closely parallels a perennial stream. <u>Due to its close proximity to the stream, this segment of right-of-way has been eliminated from consideration for herbicide application.</u>

Segment #18 is located at an elevation of 3,300 feet. This segment is a branch of the right-of-way also containing Segments #16 and #17 in Macon County; it passes through Montane Oak-Hickory forest. No streams cross this segment of right-of-way.

Segment #19 is located at an elevation of 3,000 feet. This first portion of this segment follows Glen Falls Road, then leaves the road and passes through Montane Oak-Hickory forest before crossing Yellow Mountain Road in Macon County. The segment continues beyond Yellow Mountain Road a short distance as the forest transitions to Acidic Cove at lower elevations. A perennial stream crosses this segment of right-of-way.

Segment #20 is located at an elevation of 3,600 feet. This segment closely follows Turtle Pond Road in Macon County, and is generally located within the road right-of-way. Segment #20 primarily passes through Acidic Cove forest, interspersed with white pine stands.

Segment #21 is located at an elevation of 4,300 feet. This segment generally parallels Hickory Nut Road in Macon County. Segment #21 primarily passes through Montane Oak-Hickory and Acidic Cove forests.

Segment #22 is located at an elevation of 3,900 feet. Most of the segment closely follows NC Highway 106 in Macon County; the powerline leaves the highway right-of-way at only two locations. This segment passes through Montane Oak-Hickory forests on the ridges and slopes, with Acidic Cove forests in the drainages. One perennial stream crosses this segment of right-of-way. Several areas adjacent to the highway with wet, exposed rock may support High Elevation Seep communities. <u>These rock outcrop areas are not subject to vegetation management of any type.</u>

Segment #23 is located in the Lloyd Cove area northwest of Scaly Mountain in Macon County. <u>This segment was omitted from the surveys as the entire segment was composed of underground powerlines for which vegetation management is not necessary.</u>

Segment #24 is located at an elevation of 3,000 feet. This segment can be accessed from Nichols Branch Road off of Tessentee Road (SR #1637) in Macon County. Segment #24 is unique within this project in that it consists of transmission powerlines and the wider (100 foot) right-of-way. Segment #24 primarily passes through Montane Oak-Hickory and Acidic Cove forests. Two perennial streams cross this segment of right-of-way.

Segment #25 is located along Nix Creek Road near the West Fork Pigeon River in Haywood County. This segment was omitted from the surveys as the entire segment was composed of underground powerlines for which vegetation management is not necessary.

Segment #26 is located at an elevation of 3,100 feet. This segment crosses NC Highway 215 in Haywood County. Segment #26 also crosses the West Fork Pigeon River twice; the area between the two crossings makes up the majority of this segment and is within the floodplain of the river. The forest community within much of this section can be classified as Montane Alluvial. The portion of this segment east of the West Fork Pigeon River crosses the edge of the Shining Rock Wilderness Area, which is also a proposed significant natural heritage area (SNHA). <u>Due to the large riparian floodplain and Wilderness Area crossed by the powerline right-of-way, Segment #26 has been eliminated from consideration for herbicide application.</u>

Segment #27 is located at an elevation of 2,900 feet. This segment generally parallels Black Oak Cove Road in Buncombe County. Segment #27 primarily passes through Montane Oak-Hickory and Acidic Cove forests. Two perennial streams cross this segment of right-of-way.

Segment #28 is located at an elevation of 2,800 feet. This segment is located along the shoulder of Chestnut Creek Road in Buncombe County. Montane Oak-Hickory and Acidic Cove forests are common in this area. One perennial stream crosses this segment of right-of-way at the northern end of the segment, and parallels it for several hundred feet.

Segment #29 is located at elevations from 3,500 to 5,600 feet. The western section of this segment closely follows Pisgah Creek Road in Haywood County; a short spur along Reed Creek Road is also included. Acidic Cove forest dominates the lower elevations along this segment. The eastern end of the segment is the summit of Mount Pisgah, where High Elevation Red Oak forest dominates, with significant elements of Northern Hardwood forest. One perennial stream crosses this segment of right-of-way. The eastern portion of this segment falls within the Mount Pisgah Dedicated SNHA, which is managed as a Significant Interest Area (SIA) on the Pisgah Ranger District. Due to the presence of rare plant species within this area and it being contained in a SIA, no herbicide application will occur on the eastern 950 feet of Segment #29. Due to close proximity to a perennial stream, the western 1,520 feet of this segment has also been eliminated from consideration for herbicide application.

Segment #30 is located at an elevation of 4,900 feet. This segment is located in the Pisgah Mountain Campground accessed by the Blue Ridge Parkway in Haywood County. Segment #30 primarily passes through High Elevation Red Oak forest and is contained within the Flat Laurel Gap Bog RHA. This segment has also been eliminated from consideration for herbicide application.

Segment #31 is located at an elevation of 5,100 feet. This segment is located west of the Blue Ridge Parkway in Haywood County and intersects Segment #30 to the east. Segment #31 primarily passes through High Elevation Red Oak forest. Two perennial streams cross this segment of right-of-way.

Segment #32 is located at an elevation of 4,900 feet. This segment is in Haywood County, intersects Segment #31 to the north and ends at Fryingpan Mountain tower to the south. Segment #31 crosses High Elevation Red Oak forest on ridges, transitioning to Acidic Cove forest on slopes and drainages. No streams cross this segment of right-of-way.

Segment #33 follows Headwaters Road (FS475B) from the Cradle of Forestry to the fish hatchery on the Davidson River in Transylvania County. This segment was omitted from the surveys as the entire segment was composed of underground powerlines for which vegetation management is not necessary.

Segment #34 is located at an elevation of 2,300 feet. This segment is in Transylvania County, and intersects Segment #33 near the fish hatchery on the Davidson River. Segment #34 closely follows FS 475 throughout its length; it also closely follows the Davidson River and or its tributaries for much of its length. This segment includes 16 perennial stream or river crossings. The majority of this segment includes Montane Alluvial forest; Montane Oak-Hickory forest is present on ridges.

Segment #35 is located at an elevation of 2,700 feet. Much of this segment parallels NC Highway 215 in Transylvania County. Segment #35 passes through Montane Oak-Hickory forest on uplands and transitions to Acidic Cove forest along the streams and drainages. This segment includes three crossings of the North Fork French Broad River.

Segment #36 is located at an elevation of 2,700 feet. This short segment begins and ends on Kitchens Loop Road in Transylvania County. Segment #36 begins in a small wet area, crosses a white pine stand, and ends at a perennial stream crossing.

Segment #37 is located at an elevation of 2,900 feet. This segment begins at Macedonia Church on SR #1326 in Transylvania County and extends northward through Montane Oak-Hickory forest with Acidic Cove Forest in the drainages.

Segment #38 is located at an elevation of 2,700 feet. This segment crosses Tanasee Gap Road in Transylvania County. Segment #38 primarily passes through Montane Oak-Hickory forest. Two perennial streams cross this segment of right-of-way near the northern end of the segment.

Segment #39 is located at an elevation of 3,800 feet. This segment begins where NC Highway 281 crosses Owens Gap in Transylvania County. Segment #39 passes through Montane Oak-Hickory forest with Acidic Cove Forest in the drainages. Six intermittent and two perennial streams cross Segment #39. One small bog and one waterfall are also located on the segment. Due to the presence of rare aquatic insects in streams crossing the eastern portion of Segment #39, no herbicide application will occur on the eastern portion (approximately 3,400 feet) of this segment.

2.2.3 AQUATIC ENVIRONMENT

The right-of-way segments included in this project cross numerous perennial and intermittent streams. Stream characteristics such as volume, gradient, substrate, and stability vary widely from site to site; most streams were small, high-quality streams. Due to the current vegetation management practice of leaving rhododendron, mountain laurel, and other woody shrub species, the immediate riparian area along many of the perennial and intermittent streams is dominated by shrub species.

3.0 SURVEY METHODOLOGY

Each right-of-way section was surveyed during the spring/summer of 2005 by personnel from Fish and Wildlife Associates, Inc. Rights-of-way were traveled on foot to evaluate the existing environments and identify significant natural features. Topography, terrestrial communities, aquatic resources and wetland features were documented in field notes and geo-referenced by GPS locations.

The rights-of-way were surveyed for the presence of federally threatened and endangered species, USFS Region 8 sensitive species, as well as Nantahala and Pisgah forest concern species, and their habitats. Vegetative communities were identified by forest cover type, if appropriate, or by general species composition. Vegetative communities were classified using Schafale and Weakley (1990). If encountered, the presence of rare or unique areas was also documented. Wildlife utilization of the project area was determined by actual sightings and by the presence of tracks and scat. In addition, potential presence was estimated through evaluation of habitat suitability.

4.0 SPECIES CONSIDERED AND SPECIES EVALUATED

The Nantahala-Pisgah National Forests maintain lists of threatened, endangered, and sensitive (TES) species and Forest Concern (FC) species on NFS lands; all of these species were originally considered. The lists were filtered by considering only those species listed by the North Carolina Natural Heritage Program (NCNHP), and the United States Fish and Wildlife Service (USFWS) as occurring or probably occurring in the five-county area covered by this analysis. A total of 384 species remained after this cut,

and included 200 plant species, 86 terrestrial animal species, and 98 aquatic animal species for the Nantahala-Pisgah National Forest. Appendix D contains lists of these species (available online at: http://www.cs.unca.edu/nfsnc/nepa/nepa.htm).

Each list was further narrowed by eliminating those species requiring habitats not found within the powerline rights-of-way included in this project. Species with well-defined habitat requirements (spray cliffs, granitic domes, rock outcrops, talus slopes, bogs, spruce-fir forests, etc.) as well as those requiring mature, closed-canopy forest were eliminated. The remaining 5 species are listed in Table 3, including status and a brief habitat description. Management Indicator Species (MIS) are considered in Section 6.0 below.

Habitat preferences and ranges of these plant and animal species were based on a variety of sources, including the NCNHP database, USFS (TES, FC and MIS) lists, NatureServe© database, personal communication with USFS personnel, and other reference materials. Natural community classification followed Schafale and Weakley (1990).

4.1 RARE BOTANICAL SPECIES

Field surveys in the Nantahala/Pisgah National Forests located no TES species on the powerline rights-of-way within the project area. One Forest Service sensitive aquatic lichen (*Hydrothyria venosa* – water fan lichen) has been previously located in the Charley Creek/Wolf Creek area in the Nantahala-Pisgah National Forest in the vicinity of right-of-way Segment #2. To avoid any possible negative impacts to this species, the northern portion of Segment #2 has been excluded from the proposed herbicide application program. No other stream crossings included in the current project were considered likely to provide habitat or support *Hydrothyria venosa* populations. Due to the potential for *Lysimachia fraseri* (Fraser loosestrife) habitat along existing rights-of-way within the project area, several right-of-way segments in the Highlands/Cashiers area of the Nantahala-Pisgah National Forest were re-surveyed during the optimal survey window in July 2006. This species was eliminated from consideration as these concentrated surveys identified no *Lysimachia fraseri* within the rights-of-way included in the current project. Two remaining forest sensitive plant species are included in Table 3 for the Nantahala-Pisgah National Forest; both of these species (*Fothergilla major* – large witch-alder and *Rhododendron vaseyi* – pink-shell azalea) are shrub species which are not targeted for removal during routine right-of-way maintenance. No individuals of these species were identified during the field surveys. However, any individuals occurring in the rights-of-way could be impacted in the short term if individual stems are trimmed in order to make paths through otherwise impenetrable thickets in the rights-of-way. In the long term, habitat for both of these species would likely benefit from vegetation management under the Preferred Alternative as competing woody tree species are selectively eliminated from the rights-of-way.

4.2 RARE TERRESTRIAL WILDLIFE SPECIES

Twenty-eight rare terrestrial wildlife species occur or could occur in the Nantahala-Pisgah National Forests within the five-county area considered in this analysis. Most of these species were eliminated from consideration due to lack of habitat within the powerline rights-of-way. Some of the more mobile vertebrate species could use the powerline rights-of-way during some portion of their lifespan. Habitat within the rights-of-way will change under the Preferred Alternative; however, these changes will not impact these more mobile species. Habitat for two Forest Service sensitive species was present within the powerline rights-of-way to be treated in this project (*Callophrys irus* - frosted elfin and *Speyeria diana* – Diana fritillary). *Plethodon teyahalee* (Southern Appalachian Salamanders) typically are located within moist forests and are thought to be undersampled. Dense shrub thickets within the utility corridor may serve as marginal habitat for this salamander.

4.3 RARE AQUATIC SPECIES

Eleven Forest Service sensitive aquatic animal species occur or could occur in the Nantahala-Pisgah National Forests within the five-county area considered in this analysis. Nine of the eleven species were eliminated from consideration after a review of USFS and NCNHP records indicated that no occurrences had been documented within aquatic habitats crossed by the rights-of-way included in this project. One Forest Concern aquatic animal species (*Isoperla frisoni*) and one Regional Sensitive aquatic animal species (*Gomphus diminutus*) is known to occur in aquatic habitats near right-of-way Segment #39. To avoid any possible negative impacts to these species, the eastern portion of Segment #39 has been excluded from the proposed herbicide application program. Since these species will not be impacted by the proposed vegetation management alternatives, these species were dropped from any further analysis.

Table 3. Rare species of the Nantahala-Pisgah National Forests evaluated in the analysis.

Federally Threatened and Endangered, Regional Sensitive, and Forest Concern species - Plants				
Group	**Designation[1]**	***Scientific Name***	**Common Name**	**Habitat**
Vascular Plant	Sensitive	*Fothergilla major*	Large Witch-alder	Pine-Oak/Heath, Montane Oak Woodland, Roadside
Vascular Plant	Sensitive	*Rhododendron vaseyi*	Pink-shell Azalea	Northern Hardwood Forest, High Elevation Seep, Southern Appalachian Bog, Meadow, Roadside
Federally Threatened and Endangered, Regional Sensitive, and Forest Concern species – Terrestrial Animals				
Group	**Designation[1]**	***Scientific Name***	**Common Name**	**Habitat**
Mammal	Sensitive	*Plethodon teyahalee*	Southern Appalachian Salamander	Moist forests at all elevations
Insect	Sensitive	*Callophrys irus*	Frosted Elfin	Open woods and borders, usually in dry situations; host plants *Baptisia*
Insect	Sensitive	*Speyeria diana*	Diana Fritillary	Rich woods and adjacent edges and openings; host plants *Viola*

[1] Sensitive as listed by the U.S. Forest Service (Region 8, 2001).

5.0 DIRECT, INDIRECT, AND CUMULATIVE EFFECTS OF PROPOSED MANAGEMENT ACTION

Direct, indirect, and cumulative effects associated with Alternatives A, B, and C are discussed in this section. Cumulative effects on species and their habitats are those effects that result from incremental impacts of the proposed action when added to other past, present, and reasonably foreseeable future actions. It is important to note that indirect and cumulative effects on habitats and populations from management activities can be positive or negative, depending on the nature of the proposed actions and site-specific conditions. Effects to rare species are expected to be identical between the two action alternatives included in the analysis.

It is very unlikely that, given the location and types of management proposed, any effects on terrestrial wildlife, botanical, or aquatic species or their habitats will be measurable, and therefore contribute to cumulative effects in any adverse manner. Herbicides have been used in vegetation management of powerline rights-of-way on private lands by Haywood EMC for over 20 years; selective herbicide application has been used by neighboring utilities on NFS lands for over 10 years.

5.1 RARE BOTANICAL SPECIES

Habitat for two TES plant species may occur within the project area. *Rhododendron vaseyi* and *Fothergilla major* individuals may be directly impacted to a limited extent where manual trimming is necessary for pedestrian access to rights-of-way in extremely dense areas. Shrub species are not targeted under any of the alternatives, except where paths through impenetrable thickets are necessary for pedestrian travel during the course of right-of-way maintenance. Indirect affects to this species will result if habitat for these species is improved under Alternatives B and C as herbicide application reduces woody sprout density of tree species within the powerline rights-of-way.

Large witch-alder (*Fothergilla major*)

One population of *Fothergilla major* has been documented on ridges in the headwaters of the Horsepasture River watershed on the Nantahala National Forest. The greatest likelihood of impacting *Fothergilla major* in the project area is within the Escarpment Gorge in southern Transylvania and Jackson Counties, near the segments in the Whitewater River watershed. Road improvement and timber projects have been previously or are anticipated to be completed within the foreseeable future near these areas. A land exchange of 100 plus acres was also completed within the general vicinity. No populations of this species were located on NFS lands based on botanical surveys completed for these projects. Thus there are no known direct impacts to this shrub. Small housing projects have been and are continuing to be developed across this same area on private lands. It is unknown if these developments have directly impacted populations of this species. *Fothergilla major* is able to occupy edge habitat, such as roads and trails, in portions of its range as well as across xeric forested slopes. Small patches of permanent edge have been created across this area during the last 12 years and probably will continue to increase in the foreseeable future. Provided a small, localized population of this species was not extirpated with the edge creation, the species should be able to persist within this habitat. Open edge habitat will also be increased with implementation of the proposed powerline maintenance project. This may cumulatively result in a slight increase in suitable habitat for *Fothergilla major*.

Fothergilla major has only been impacted by previous projects within the Linville Gorge Wilderness from the recurrent prescribed burns to restore *Hudsonia montana* (mountain golden heather) habitat on the rim of the Linville Gorge. These impacts have been short-term in top-killing individuals while in the long-term creating patches in denser portions of ericaceous (heather family) shrub thickets thereby resulting in more vigorous growth of this shrub. No other project has impacted *Fothergilla major* across the Nantahala-Pisgah National Forests. Therefore, this project is not likely to cause a trend to federal listing or a loss of viability across the Forest.

Pink-shell azalea (*Rhododendron vaseyi*)

Rhododendron vaseyi, a North Carolina endemic shrub, has been documented across 11 counties, from Watauga County to southern Jackson County. Thirty-three occurrences have previously been documented on the Nantahala-Pisgah National Forests. Twenty-one of these occurrences are within 0.5 aerial mile of the powerline rights-of-way dispersed from Buncombe County to Jackson County. During the last 12 years, a small portion of the larger populations located within the surrounding landscape was impacted by four timber projects, including road reconstruction and skidding. One recent harvest area

was noted to have a very vigorous flowering population with many seedlings (G. Kauffman, personal observation). While no monitoring data was available for this area, it appears the greater amount of light has stimulated the local population.

Under Alternatives B and C, reduced tree growth within the powerline rights-of-way may result in a positive impact to *Rhododendron vaseyi*. None of the alternatives included in this proposal will adversely impact the viability of this species across the Nantahala-Pisgah National Forests.

5.2 RARE TERRESTRIAL WILDLIFE SPECIES

Under any of the alternatives included in this analysis, examples of direct effects on terrestrial species include (but are not limited to) things such as short-term alteration of activity patterns as a result of temporary human presence within the powerline rights-of-way. Examples of indirect effects on terrestrial species include (but are not limited to) altered reproductive or foraging success as a result of changes in escape and nesting cover or food availability.

Over time, Alternatives B and C will involve loss of the thick layer of small slash that has accumulated on the surface of the ground within the powerline rights-of-way. Selective herbicide application will result in less sprouting of tree species, less need for mechanical trimming, and less accumulation of slash on the ground. Escape cover for some species (small mammals, reptiles) may temporarily decrease; however, the associated shift to shrub species and increased herbaceous groundcover will benefit other species considerably. These changes in habitat will not impact terrestrial wildlife species, and will likely result in an increase in wildlife habitat diversity on NFS lands within the project area.

No federally protected terrestrial wildlife species or their habitats will be affected by any of the alternatives included in this project. No federally threatened and endangered terrestrial wildlife species will be impacted by the proposed project. No trees >3' dbh occur within the powerline rights-of-way; potential roosting habitat for the Indiana Myotis is not present within these areas. Habitat for Regional Sensitive species listed in Table 3 may occur in some portions of the project area; the vegetation management practices included in Alternatives B and C will have positive impacts (if any) on edge/open habitat for the two butterfly species. The two action alternatives may reduce habitat for Southern Appalachian Salamanders. Effects or impacts to these species are listed in Table 4.

Frosted elfin (*Callophrys irus*) and Diana fritillary (*Speyeria diana*)

Callophrys irus is found in open woods and borders, usually in dry situations. Its host plant is wild indigo (*Baptisia spp.*), which occur in drier portions of the powerline rights-of-way. Females lay eggs on the flower buds, and the caterpillars feed on the flowers and seedpods. In late summer, the caterpillars build a shelter on the ground by tying leaves together with silk, and they overwinter in the pupal stage. In very early spring, the new adults emerge and fly.

Speyeria diana is found in various community types but seems to prefer edge and openings adjacent to Rich Cove Forest. Often these edges are roadsides. Its host plant is believed to be violet (*Viola spp.*), many which are scattered across the project area. Males patrol for females in deep woods. Females walk along the ground laying single eggs on dead twigs and leaves near violets. The caterpillars hatch and overwinter without feeding. In the spring they feed on leaves and flowers of violets.

Neither of these butterflies was found during surveys in the project area. There are records for Diana fritillary within the five counties that span the project area. Four occurrences were previously located within habitats less than 5 aerial miles of segments both in the northern portions of the activity area as well as the southern portion of the activity area. There are no known occurrences of frosted elfin near the

proposed activity areas. The greatest likelihood of habitat for this species would be in the northern portion of the project area since this species was historically documented in Buncombe County. The exact location of this occurrence is obscure.

There should be no direct impacts to either of these butterflies since none of the alternatives included in the analysis involve heavy equipment that could crush plants with egg masses or caterpillars of the frosted elfin and Diana fritillary. No ground-disturbing activities are proposed either. Under Alternatives B and C, the proposed herbicide activity on existing trees should open up drier portions of the right-of-way. This may indirectly improve suitable habitat for frosted elfin within these areas provided there is not abundant evergreen ericaceous shrubs, such as *Kalmia latifolia* (mountain laurel) that could eventually spread with the removal of competing tree species. Under Alternatives B and C, an indirect benefit to Diana fritillary may also result from the project with improvement in suitable habitat, especially where the powerline is adjacent to rich cove forest communities.

The impacts of past actions such as timber sales could have crushed plants with eggs or caterpillars, or overwintering caterpillars or eggs on the ground could have been run over. Opening up the forest through timber harvest may have increased habitat for frosted elfin but decreased habitat for Diana fritillary. During the next planning period, some of the private property in the general vicinity of the powerlines may be permanently converted from forested habitat to residential communities. Activities on private land could directly impact the frosted elfin and Diana fritillary in a similar manner to activities on NFS lands. It is doubtful that habitat will be improved for these butterflies by the development of manicured lawns.

Alternatives B and C may improve habitat for both of these butterfly species. In the short term, past projects on NFS lands and activities on private land could have directly impacted local populations of frosted elfin within the northern portion of the project area and Diana fritillary throughout the project area. However, activities on NFS lands could also help improve habitat in the long term by creating more open, drier forest conditions for the frosted elfin and by increasing edge habitat for Diana fritillary. The present project should cumulatively add to these long-term benefits for both these butterfly species.

Diana fritillary has been documented within 15 of the 18 western most counties. Over half of the occurrences, greater than 40, are known to occur within the Nantahala-Pisgah National Forest. As a result of all the recent documentations for this species the North Carolina Natural Heritage Program no longer formally tracks Diana fritillary (LeGrand et al. 2004). Therefore, this project is not likely to cause a trend to federal listing or a loss of viability across the Forest. There are no known occurrences for frosted elfin on NFS lands. The proposed activities will not directly affect any individuals if they are present, but may improve habitat for this species within the northern portion of the project area.

Southern Appalachian salamanders *(Plethodon teyahalee*)

Southern Appalachian salamanders were not found during the field survey. The species might occur within denser ericaceous shrub thickets particularly on moist slopes. There should be no direct impacts to this salamander from the proposed project since none of the alternatives included in the analysis involve heavy equipment that could crush individuals. No ground-disturbing activities are proposed either. Under Alternatives B and C, the proposed herbicide activity on existing trees should open up drier portions of the right-of-way. In addition dense shrub thickets providing some habitat for this salamander could be partially cut to allow access for other areas to treat targeted trees. These two activities may indirectly degrade suitable habitat for Southern Appalachian Salamanders. If so, the reduction in the shrub layer could result in impacts to individuals. However the proposed activity is unlikely to significantly affect the available habitat for this species within this area of the Pisgah and Nantahala National Forests. Optimal habitat for this species is located within more mesic forested areas adjacent in

different segments of the powerline corridor and will not be affected by any of the proposed alternatives. This species has generalized mesic forest habitat requirements and may occupy much of the forested land across several counties in western North Carolina. While there will be direct and indirect cumulative affects to Southern Appalachian salamanders from previous other projects across the utility corridor project area that may affect individuals of this species, none of these projects are expected to extirpate the salamander from any single site.

Southern Appalachian salamander populations have been recently documented in numerous locations in moist forests in the southwestern mountains at all elevations. It is thought to be fairly common across Graham, Swain, Cherokee, Clay, Macon, Haywood and Transylvania Counties. Thirteen separate sites for this salamander have been located within 1 mile of the proposed utility line activity area. These sites have been located within forested stands and will not be impacted by the proposed utility line vegetation control project or any anticipated project within the foreseeable future.

5.3 RARE AQUATIC SPECIES

None of the alternatives included in the analysis will have an effect on any federally threatened or endangered aquatic species, on any Regional Sensitive aquatic species, or any Forest Concern aquatic species identified in this analysis, or their habitat. One Forest Concern aquatic animal species (*Isoperla frisoni* – a stonefly) and one Forest Service sensitive aquatic animal species (*Gomphus diminutus* – a dragonfly) is known to occur in aquatic habitats near right-of-way Segment #39. To avoid any possible negative impacts to these species, approximately 3,400 feet of the eastern portion of Segment #39 has been excluded from the proposed herbicide application program. A 100 foot no-herbicide buffer will be observed on either side of perennial streams and lakes within the project area, or a 30 foot no-herbicide buffer will be observed where the riparian area has been delineated by USFS personnel on the ground. Vegetation management practices will not target woody understory evergreen species presently affording riparian cover. Mitigation measures discussed later in this analysis will further ensure that the aquatic environments included within the project area are not impacted.

5.4 DETERMINATION OF EFFECT OR IMPACT

Potential effects to federally threatened or endangered species and their habitats and potential impacts to Forest Service sensitive species and their habitats were considered. Effects and impacts associated with the no-action alternative (Alternate A) and the action alternatives (Alternatives B and C) are listed in Table 4.

Table 4. Summary of Effects to Federally Threatened or Endangered Species, Region 8 Sensitive Species, and Forest Concern Species and Their Habitats.

Species	Group	Alt A	Alt B	Alt C
Federally Threatened and Endangered and Forest Sensitive species – Plants				
Fothergilla major	Vascular Plant	Short term; May impact individuals; Long term: no impact	Short term: may impact individuals; Long term: increase in suitable habitat	Short term: may impact individuals; Long term: increase in suitable habitat
Rhododendron vaseyi	Vascular Plant	Short term; May impact individuals; Long term: no impact	Short term: may impact individuals; Long term: increase in suitable habitat	Short term: may impact individuals; Long term: increase in suitable habitat
Federally Threatened and Endangered and Forest Sensitive species – Terrestrial Animals				
Callophrys irus	Insect	No impact	Short term: no impact; Long term: increase in suitable habitat	Short term: no impact; Long term: increase in suitable habitat
Speyeria diana	Insect	No impact	Short term: no impact; Long term: increase in suitable habitat	Short term: no impact; Long term: increase in suitable habitat
Plethodon teyahalee	mammal	No impact	Short term & Long term: decrease in marginal habitat	Short term & Long term: decrease in marginal habitat

Federally Proposed, Endangered, and Threatened Species

No federally listed species or suitable habitat was observed within the proposed treatment areas. All the action alternatives will have no effect on any federally listed or proposed species. Concurrence from the U.S. Fish and Wildlife Service is not required.

Sensitive Species

Two Regional Forester's sensitive plant species, *Fothergilla major* and *Rhododendron vaseyi* may occur within the project corridor. Both of these species could occur within areas with dense shrubs and may be temporarily impacted if they are cut for access trails to target tree species. All the action alternatives may impact individuals of *Fothergilla major* and *Rhododendron vaseyi*, but is not likely to cause a trend toward federal listing.

Three regional forester's sensitive animal species, *Speyeria diana, Callophrys irus, and Plethodon teyahalee* may occur within the proposed activity area. The proposed action alternatives may impact individuals of *Plethodon teyahalee* but will not impact the viability of this species across the Nantahala and Pisgah National Forests. The proposed action alternatives

is expected to improve suitable habitat for the two butterfly species, *Speyeria diana and Callophrys irus* and may beneficially impact these two species.

Forest Concern Species

No forest concern species or their habitat is known to occur within the proposed utility corridor. None of the action alternatives will result in a loss of sites for these species across the Nantahala or Pisgah National Forests.

6.0 MANAGEMENT INDICATOR SPECIES

Management Indicator Species (MIS) serve as the system to monitor Forest Plan implementation and effects on diversity and population viability of all native and desirable non-native plants and animals. At the project scale, MIS are used to focus the effects of proposed activities on habitat types. When these effects are evaluated within a forest wide context, it is determined whether or not any trends for MIS would change. An assessment of habitat changes linked to MIS is documented in this section. The assessment provides an evaluation of project level activities, the change in habitat used by MIS, and the likely contribution to forest wide trends.

The amount of habitat changed by the project is checked for consistency with the Forest Plan and the recent trends in activities. If any inconsistencies are revealed, then further investigation should be made to determine effects on MIS. However, if the project activities are consistent with recent trends, then effects of habitat changes to MIS should remain constant. Tables 5 and 6 list each MIS species and the biological communities and special habitats they represent. For the Haywood EMC powerline right-of-way project, the rufous-sided towhee was selected to represent early successional habitat. This special habitat is the only habitat found within the project activity area. Although woody debris is presently abundant on many of the right-of-way segments included in this project, this debris is typically less than 3” in diameter and is the result of recent mechanical trimming of woody regeneration within the rights-of-way. This debris does not provide the same habitat structure as the downed woody debris important to ruffed grouse in mature forested settings. The biological communities listed in Table 5 will not change as a result of project alternatives, as these communities are simply crossed by the existing rights-of-way, which will remain.

6.1 EARLY SUCCESSIONAL HABITAT

Early successional habitat is defined as habitat from 0 to 10 years old, usually resulting from some natural or human-induced disturbance. Within the rights-of way included in the project area, there are approximately 290 acres of early successional habitat. This habitat has been maintained by mechanical trimming of woody vegetation; the Preferred Alternative will change the method by which these early successional areas are maintained, but will not change the extent of early successional habitat on the Nantahala-Pisgah National Forests.

Table 5. Biological communities and associated MIS (using Forest Plan EIS, Table III-8).

Biological Community	MIS	Analyzed Further/Evaluation Criteria*
Fir dominated high elevation forests	Fraser fir	No/1
Northern hardwood forests	Ramps	No/1
Carolina hemlock bluff forests	Carolina hemlock	No/1
Rich Cove forests	Ginseng	No/1
Xeric yellow pine forests	Pine warbler	No/1
Reservoirs	Largemouth bass	No/1
Riparian forests	Acadian flycatcher	No/1
Coldwater streams	Brook, brown, and rainbow trout; blacknose dace	No/2
Coolwater streams	Smallmouth bass	No/1
Warmwater streams	Smallmouth bass	No/1

*1 Biological community and its represented species do not occur in the activity area; therefore, this biological community will not be affected. Given no effects to the community, the alternatives will not cause changes to forest-wide trends or changes in population trends of species associated with this community.
*2 Coldwater streams are crossed by HEMC powerline right-of-way within the project area. However, riparian buffers required by the Forest Plan will ensure that riparian areas adjacent to these streams will not be impacted.

Table 6. Special habitats and associated MIS (using Forest Plan EIS, Table III-9).

Habitat Components	MIS	Analyzed Further/Evaluation Criteria*
Old Forest Communities (100+ years old)	Black bear	No/1
Early successional (0-10 years old)	Rufous-sided (eastern) towhee	Yes
Early successional (11-20)	Ruffed grouse	No/1
Soft mast producing species	Ruffed grouse	No/1
Hard mast-producing species (>40 yrs)	Black bear	No/1
Large contiguous areas with low levels of human disturbance	Black bear	No/1
Large contiguous areas of mature deciduous forest	Ovenbird	No/1
Permanent grass/forb openings	White-tailed deer	No/1
Downed woody debris	Ruffed Grouse	No/1
Snags	Pileated woodpecker	No/1

*1 Biological community and its represented species do not occur in the project area; therefore, this biological community will not be affected. Given no effects to the community, the alternatives will not cause changes to forest-wide trends or changes in population trends of species associated with this community.

Table 7. Estimated change in biological communities and special habitats.

Biological Community	Alt A	Alts B & C
Fraser fir forests	None affected.	None affected.
Northern hardwood forests	None affected.	None affected.
Carolina hemlock bluff forests	None affected.	None affected.
Rich cove forests	None affected.	None affected.
Yellow pine successional communities	None affected.	None affected.
Reservoirs	None affected.	None affected.
Riparian forests	None affected.	None affected.
Cold water streams	None affected	None affected.
Warm water streams	None affected.	None affected.
Special Habitats	**Alt A**	**Alts B & C**
Old forest communities (100+ years old)	None affected.	None affected.
Early successional communities (0-10 yr)	290 acres included; no change anticipated.	290 acres included; minimal change anticipated.
Early successional communities (11-20 yr)	None affected	None affected.
Soft mast-producing species	None affected.	None affected.
Hard mast-producing species (>40 yr)	None affected.	None affected.
Contiguous areas with low disturbance (<1 mi. open road/4 sq. miles)	None affected.	None affected.
Large contiguous forest	None affected.	None affected.
Permanent grass/forb openings	None affected.	None affected.
Snags and dens (>22" dbh)	None affected.	None affected.
Down woody material	None affected.	None affected.

6.2 SPECIES EVALUATED AND RATIONALE

All MIS potentially affected by project activities were initially evaluated (see Table 5 and Table 6). Information about Forest-wide MIS habitats and population trends is contained in the Forest MIS report: *Management Indicator Species Habitat and Population Trends* (available online at: http://www.cs.unca.edu/nfsnc/nepa/nepa.htm). The rufous-sided towhee was selected as the MIS to represent early successional habitat, which is the only special habitat or biological community found within the project activity area.

Rufous-sided towhee (*Pipilo erythrophthalmus*)

Preferred habitat for the rufous-sided towhee includes forest edges, regenerating clearcuts, forests with thick understory, riparian thickets, and other brushy habitats. Nests may be built on or above the ground, and placed among dense, woody vegetation. The towhee typically forages on the ground in dense vegetation for seeds, buds, stems, and invertebrates. Breeding Bird Survey data show a significant global population decline of 2% per year between 1966 and 1998. This decline has been attributed to an overall reduction in early successional habitat across the species range.

The no-action alternative may have limited direct impact on the rufous-sided towhee. It is possible that active nests could be destroyed as the brushy regeneration is periodically trimmed within the powerline rights-of-way. However, the impact of this chance occurrence on the population of rufous-sided towhee on the forest would likely be imperceptible.

The no-action alternative will continue to provide some positive, indirect impacts for rufous-sided towhee habitat. Mechanical trimming of the woody vegetation within the rights-of-way will continue on a 5-year rotation. This will result in the continued maintenance of early-successional habitat for the rufous-sided towhee on the forest. As all of the right-of-way segments are not treated at once, there will be some newly-cut segments where brushy tree regeneration is absent whereas other segments will have 4-year-old brushy regeneration. There will be no cumulative effect with implementation of the activities associated with project.

The Preferred Alternative will likely have less direct impact on the rufous-sided towhee, as the goal of herbicide application is to significantly reduce or eliminate the need for mechanical trimming. Reduction of mechanical trimming will reduce the likelihood of destruction of active nests. Indirect impacts are anticipated to be positive, as the Preferred Alternative will also maintain early successional habitat. The structure of the early successional habitat will change somewhat, as shrub and herbaceous species will increase as regeneration of tree species will decrease. Total amount of thick underbrush will decrease, whereas the stability of the habitat will increase as the increasing shrub layer will be allowed to remain in the right-of-way as the brushy tree regeneration will be reduced. As this project will not cause an increase or decrease in the total amount of early-successional habitat on the forest, but will maintain this habitat within the powerline rights-of-way, no cumulative impacts are anticipated. The project will not change the overall population trend for the rufous-sided towhee on the Forest.

7.0 CONSULTATION HISTORY

This project will have no effect on any federally listed threatened or endangered species. Consultation with the USFWS is not required.

8.0 HISTORIC AND ARCHAEOLOGICAL RESOURCES

No ground-disturbing activities will occur under the No-Action or action alternatives. For this reason, no historic or archaeological resources will be impacted within the activity areas. The alernatives have been reviewed by the Forest Archeologist and he has determined that the prolect has no potentioal for effect, adverse of beneficial, to a HRHP eligible heritage resource and is consided an Exempting Undertaking. No furthe Seciton 106 compliance documentation is required.

9.0 HUMAN ENVIRONMENT

9.1 HUMAN HEALTH

Human health risks under the No-Action alternative and the action alternative include those to the general public and those to workers involved in vegetation management. The No-Action alternative poses human health risks to workers in the form of increased use of chainsaws and pruners. Use of this equipment increases the risk to worker injury. Health risks to the general public are typically due to vegetation removal near roadways and road shoulders by where powerline rights-of-way run adjacent to roadways. Many of these roads in mountainous terrain must be temporarily blocked when trees are removed; this can increase the likelihood of worker and public injury and can impede traffic flow.

Human health risks associated with the action alternatives include those listed above for the No-Action alternative, although these risks will decrease as mechanical vegetation removal becomes less frequent due to reduced tree regeneration within the powerline rights-of-way. The use of herbicides has the potential to cause adverse effects to worker and public health; however, the risks can be greatly reduced by following the mitigation measures listed in Section 10.0 of this document. Each herbicide included in this project was individually discussed in Section 1.3.3, including potential toxicity to humans; Material Safety Data Sheets (MSDS) for each herbicide are included in Appendix A (available online at: http://www.cs.unca.edu/nfsnc/nepa/nepa.htm).

9.2 VISUAL RESOURCES

Impacts to visual resources under the No Action alternative are typically minor, and persist until new tree regeneration obscures slash from previous mechanical trimming. These impacts include cutting of saplings within the rights-of-way, and subsequent browning of foliage on the felled saplings.

Visual impacts associated with both of the action alternatives are expected to be the same and will include the browning of dying vegetation after herbicide application in late summer. When compared to the No-Action alternative, these impacts may be greater in the short-term, as foliage on the standing saplings will be more visible than on felled saplings on the ground. Long-term visual impacts associated with the Action Alternatives will include an increase in the presence of low-growing woody species such as dogwood, mountain laurel, and rhododendron in some areas and herbaceous cover in others areas. Adverse impacts associated with the action alternatives are not expected to be noticed by the typical Forest visitor approximately 1 year after application. As the herbicide application program will reduce tree species regeneration in future years, grasses, forbs, and shrubs will quickly colonize areas void of larger, competing vegetation. A more stable shrub and herbaceous plant community will result. Visual impacts in the long term are expected to be greatly reduced when compared to the No-Action Alternative for this reason.

10.0 PROJECT DESIGN FEATURES

Project design features are management actions that are required to maintain compliance with environmental laws and regulations. The following actions address concerns in several categories; these project design features would be implemented for Alternatives B and C:

10.1 PUBLIC HEALTH

- Only herbicides approved by the USFS are to be applied; these herbicides will be applied at the lowest effective rates of application.
- Directed treatment via a backpack sprayer is one of the most selective herbicide treatment methods; no broadcast treatments (aerial or land based) will be used. Only those species that have the potential to grow into the powerline will be selectively treated.
- Herbicide application will not occur when the ambient temperature is above 98ºF, humidity is below 20%, or wind speed exceeds 15 mph. Herbicides will be applied to the windward side of target trees to avoid drift onto the herbicide applicators.
- Distance from the nozzle to target trees will not exceed 24”.
- Applicators will be State of North Carolina certified pesticide applicators, and will receive training as to field identification of target species.
- Applicators must wear personal protective equipment (PPE) as prescribed on the product labels.

- Herbicide tank mixes will be premixed at the supplier's location in reusable containers. No galvanized steel or unlined steel (except stainless steel) containers will be used. No concentrate will be handled in the general area. No field mixing will be conducted.
- Only the amount of herbicide needed for the day's use will be brought on site. All unused herbicide will be returned to storage.
- Field loading of herbicide will not occur within 200' of private land, public or domestic water sources or other sensitive areas.
- Equipment will be checked daily for leaks.
- Accident preplanning and emergency spill plans will be prepared and located onsite during application. Herbicide product labels will be kept onsite during application. These documents will be readily available to the application crew. Water-filled eyewash bottles will be onsite and readily available to applicators.
- Herbicide product labels will be adhered to at all times, in accordance with federal law.

10.2 WATER QUALITY

- No herbicides will be applied to rock outcrops.
- No herbicide will be applied within 100 horizontal feet of any public or private water sources.
- Herbicide application will be terminated during periods of rainfall or when rain is imminent.

10.3 TES SPECIES AND HABITATS

- No herbicide will be applied within 30 feet of any known threatened, endangered, or sensitive plant species.

11.0 COST ESTIMATES

The following table discloses costs estimates of implementing the alternatives analyzed in detail over a 15-year period.

Table 8. Cost estimates over a 15-year period by alternative.

	Alternative A (Mechanical Trimming)	**Alternatives B&C**[1] (Foliar Application)
Estimated Cost (per mile over 15 years)	$36,960	$10,295
Maximum Estimated Cost (total miles over 15 years)	$2,217,600	$617,700

1 Includes 5.35 miles of mechanical treatment around perennial streams

Alternatives B and C are the most cost effective alternatives to implement because they propose the least amount of mechanical trimming.

12.0 LIST OF PREPARERS

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13.0 REFERENCES

BASF. 2001. Arsenal® Technical Bulletin. BASF Corporation, Research Triangle Park, North Carolina.

Dow Agrosciences. 2002. Accord® Family of Herbicides: Technical Fact Sheet. Dow Agrosciences LLC, Indianapolis, Indiana.

Dow Agrosciences. 2003. Garlon 4® Fact Sheet. Dow Agrosciences LLC, Indianapolis, Indiana.

DuPont. 2003. Krenite® Fact Sheet. E. I. du Pont Nemours and Company, Wilmington, Delaware.

LeGrand, H.E.Jr., S.P. Hall and J.T. Finnegan. 2001. Natural Heritage Program list of the rare animal species of North Carolina. North Carolina Natural Heritage Program, Division of Parks and Recreation, N.C. Department of Environment and Natural Resources. 90pp.

NatureServe. 2007. NatureServe Explorer: An online encyclopedia of life [web application]. Version 4.5. NatureServe, Arlington, Virginia. Available http://www.natureserve.org/explorer. (Accessed: September 2007).

North Carolina Natural Heritage Program. 2008. Heritage Database. Natural Heritage Program, North Carolina Department of Environment and Natural Resources, Raleigh, North Carolina. Available http://www.ncnhp.org/Pages/heritagedata.html. (Accessed: October 2008).

Schafale, M. P. and A. Weakley. 1990. *Classification of the Natural Communities of North Carolina*: *Third Approximation*. North Carolina Natural Heritage Program, Raleigh, North Carolina.

U.S. Environmental Protection Agency. 1993. Reregistration Eligibility Decision: Glyphosate. U.S. Environmental Protection Agency, Office of Prevention, Pesticides and Toxic Substances, Washington, D.C.

U.S. Forest Service. 1989. Final Environmental Impact Statement, Vegetation Management in the Appalachian Mountains (VMEIS), and subsequent revisions. Forest Service Southern Region, Atlanta, GA.

U.S. Forest Service. 2006. Proposed, Endangered, Threatened, and Sensitive (PETS) Plants and Animals Database. National Forests in North Carolina, Asheville, NC.

14.0 APPENDICIES

Appendices are available online at: http://www.cs.unca.edu/nfsnc/nepa/nepa.htm as follows:

Appendix A: material Safety Data Sheets for Herbicides Considered in the Analysis
Appendix B: Project Area Maps
Appendix C: Project Area Photographs
Appendix D: Rare Species List for Federally Endangered, Threatened, Forest Sensitive and Locally Rare Species for the Nantahala/Pisgah National Forests recorded in Buncombe, Haywood, Jackson, Macon and Transylvania Counties, North Carolina.
Appendix E: Response to Public Comments