APPENDIX G – BIOLOGICAL EVALUATION

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BIOLOGICAL EVALUATION
TVA Ocoee 2-Ocoee 3 Transmission Line
USDA FOREST SERVICE, SOUTHERN REGION

CHEROKEE NATIONAL FOREST
OCOEE RANGER DISTRICT

INTRODUCTION

A biological evaluation was conducted pursuant to Section 2670 of the USDA Forest Service Manual to determine potential impacts to threatened, endangered, or sensitive (TES) species and their habitats by the proposed construction of the Ocoee 2-Ocoee 3 161-kV transmission line, and to ensure land management decisions are made with the benefit of such knowledge. The objectives of this evaluation are to:

1. Ensure Tennessee Valley Authority actions do not contribute to a loss of viability of any plant or animal species or cause a trend toward federal listing of any species.
2. Comply with the requirements of the Endangered Species Act that actions by federal agencies not jeopardize or adversely modify critical habitat of federally listed species.
3. Provide a process and a standard by which TES species receive full consideration in the decision-making process.
4. Meet requirements of FS Manual Supplement R8-2600-2002 which provides direction for the preparation of site-specific BEs, including when to conduct an inventory for PETS plant and animal species.

PROPOSED ACTION AND ALTERNATIVES

The Tennessee Valley Authority proposes the following project within Polk County:

Description of Alternatives

Alternative 1 – Rebuild Ocoee 2-Ocoee 3 Transmission Line in Place

Under this alternative, TVA would rehabilitate the transmission line (TL) in phases. TVA would initially replace seven towers and two poles and all the hardware and insulators. In the second phase, TVA would replace eight towers and replace the conductor for the entire TL. In the final phase, TVA would replace the remaining towers. This alternative would take approximately 36 months to complete. During the construction, the TL would be deenergized. However, in peak demand periods, work would cease and the transmission line would be put back in operation to support the transmission system. During these peak periods, the parts of the existing line not already replaced would continue to risk outage, with associated monetary and man-power maintenance costs.

The availability of the 28 MW of generation for supporting peak loads would be reduced during construction of this alternative because this is the only transmission connection for the 28 MW of generation from Ocoee 2 Hydro Plant. The majority of the TL would be constructed using helicopters due to lack of access for heavy equipment. Helicopters would be used to carry in/out materials such as structures, conductors, and necessary construction equipment (i.e., generators, augers, chain saws). A laydown yard (pole yard) would be required for worker assembly, vehicle parking, and material storage. An area

south of the TL off National Forest System Road (NFSR) 145 would be used for the pole yard. Due to locations of the TL and pole yard, the helicopter would cross the Ocoee River and US 64 multiple times a day during the project.

Alternative 2 – Build Ocoee 2-Ocoee 3 Transmission Line Using New Right-of-Way and Portions of Existing Right-of-Way

Under this alternative, TVA would build a new transmission line using new right-of-way which would overlap portions of the existing transmission line right-of-way. The route would be approximately four miles long and require a 75 foot wide ROW, for 36 acres of additional ROW. The new TL would have 22 structures, compared to the 24 structures of the existing TL. As with the alternative to rebuild in place, the laydown yard (pole yard) for worker assembly, vehicle parking, and material storage would be located in the area south of the TL off National Forest System Road (NFSR) 145. Construction would take about seven months. The proposed new ROW is mostly forested. Once the new transmission line was built and connected to the TVA transmission system, the existing Ocoee 2-Ocoee 3 transmission line would be removed. Investigations determined the route had very steep rocky terrain and limited access resulting in constructability and safety concerns. The majority of the transmission line would be constructed using helicopters and increased manual labor due to lack of access for heavy equipment. The route is located in a high use area, crossing the river six times, three streams, and U.S. 64 eight times. Flying project materials over these high-traffic areas and existing transmission line would be a safety concern. Another safety concern would be construction crews working near the existing transmission line, particularly with helicopters.

Alternative 3 – No Action

Under the No Action Alternative, TVA would continue to serve the load by maintaining the existing transmission line. Because of the deterioration of the TL, TVA would essentially have to rebuild it, so the main difference between this No Action Alternative and Alternative 1, Rebuild in Place, would be the duration of the rebuilding effort. Under the No Action Alternative, funds and work force would be allocated in accordance with TVA's overall maintenance budgets and planning, so the rebuilding would probably occur over a 10-year period. This would result in an extended time of unreliability of the TL until the rebuilding would be completed. In addition, because only a small amount of work would be done at a time, TVA would not use a laydown area (pole yard) but would bring in material for individual activity from a remote location. Some of the maintenance activity would require the TL to be deenergized. This type of maintenance would most likely not be scheduled during peak generation periods when the generation would most be needed. Due to the extended duration of this alternative, the existing transmission line would continue having outages and customer connection point interruptions.

Alternative 4 – Build Ocoee 2-Ocoee 3 Transmission Line Using New Right-of-Way South of the Ocoee River (Proposed Alternative)

Under Alternative 4, TVA would build a 161-kV transmission line from the Ocoee 2 switchyard to the Ocoee 3 switchyard south of the Ocoee River on land located in the Cherokee National Forest. The new transmission line would be 4.66 miles in length on a right-of-way (ROW) 100 feet wide, therefore the total amount of land used would be approximately 56 acres. The line would be constructed using h-frame steel pole structures.

Construction would take about 11 months. Once the new transmission line was built and connected to the TVA transmission system, the existing Ocoee 2-Ocoee 3 transmission line would be removed.

By allowing the existing line to continue in service while the new line is being built, this alternative would limit the outage duration. This would allow the 28 MW of generation to be available when needed for peak loads during construction; provide reliable station service to Ocoee 2 during construction, and save costs and man-power in maintenance costs associated with keeping the Ocoee 2-Ocoee 3 transmission line operable.

Removal of the Existing Transmission Line

The existing Ocoee 2-Ocoee 3 69-kV TL would be removed once the new transmission line is in operation, and the ROW would be allowed to revert to its natural state. The conductor would be removed from the insulators and reeled onto a reel. The hardware would be removed from each structure and be removed from site using vehicle or helicopter. Each structure would be cut below grade and removed from site using vehicle or helicopter. The scrap material would be recycled. All removal activities would be conducted according to the U. S. Forest Service Revised Land and Resource Management Plan (RLRMP) guidelines.

Vegetation Management

Management of vegetation along the ROW would be necessary to ensure access to structures and to maintain an adequate distance between TL conductors and vegetation. The TL would be designed to meet a 24-foot minimum clearance as required by the National Electric Safety Code. Management would consist of the felling of danger trees adjacent to the cleared ROW and the control of vegetation within the cleared ROW.

Management of vegetation within the cleared ROW would use an integrated vegetation-management approach designed to encourage the low-growing plant species and discourage tall-growing plant species. A vegetation-reclearing plan would be developed in consultation with CNF for each TL segment based on the results of the periodic inspections described above. These plans would be consistent with the RLRMP and Vegetation Management Environmental Impact Statement (VMEIS), as amended. The two principal management techniques would be mechanical mowing, using tractor-mounted rotary mowers, and herbicide application. Herbicides would normally be applied in areas where heavy growth of woody vegetation is occurring on the ROW and mechanical mowing is not practical. Herbicides would be selectively applied from the ground with backpack sprayers or vehicle-mounted sprayers. Any herbicides used would be applied in accordance with applicable state and federal laws and regulations. Only herbicides registered with the U.S. Environmental Protection Agency and in compliance with the RLRMP and the VMEIS would be used. Application rates are expected to be in the ranges used by CNF for vegetation management as reviewed in the VMEIS and determined in that study to have no significant adverse impacts if used according to approved procedures. Herbicides to be used would be:

Glyphosate: This chemical is commonly found in brand name products such as Roundup, Accord, and Rodeo. Glyphosate is a broad-spectrum herbicide used to kill grasses and

broadleaf weeds. Rodeo is a formulation labeled for aquatic use. The range of application rates is 0.5 pounds (lbs) a.e./acre to 7 lbs a.e./acre with 2 lbs a.e./acre being typical.

Imazapyr: This chemical is commonly found in brand name products such as Arsenal and Habitat. Imazapyr is commonly tank-mixed with other products to ensure control of undesirable vegetation. The range of application rates is from 0.06 lbs to 1.5lbs a.e./acre.

Fosamine Ammonium: This product is commonly found in brand name products such as Krenite S and is a brush-control agent.

Metsulfuron Methyl: This chemical is found in the product Escort, which controls broadleaf weeds and brush.

Triclopyr: This chemical is found in brand name products such as Garlon 3A and Garlon 4. Triclopyr is most effective on broad-leaved plants and is used for noxious weed control such as kudzu, planting site preparation, and release of tree seedlings from competition. The range of application rates is 0.05 lb a.e./acre to 10 lbs a.e./acre.

Clopyralid: This chemical is found in brand name products such as Transline. Clopyralid is very effective against kudzu, but most trees and grasses are tolerant of it. It may be used for wildlife opening maintenance, planting site preparation, and release of tree seedlings. The range of application rates is about 0.1 lb a.e./acre to 0.5 lb a.e./acre

Numerous safeguards as specified in pages. A-10-15 of the VMEIS Record of Decision would be taken to minimize risks of herbicide use to human and environmental health. These safeguards are listed in the mitigation section of chapter 4.

Other than vegetation management, only minor maintenance work would normally be required. TL structures and other components typically last several decades. In the event that a structure must be replaced, it would normally be lifted out of the ground by crane-like equipment, and the replacement structure would be inserted into the same hole or in an immediately adjacent hole. Access to the structures would be on existing roads where possible. Replacement of structures could require leveling the area surrounding the replaced structures, but there would be little, if any, additional area disturbance when compared to the initial installation of the structure. Maintenance work would follow RLRMP standards.

AFFECTED AREA

The proposed project occurs within the southern portion of the Blue Ridge Mountain Province (Bailey 1995). The Blue Ridge Mountains of Tennessee are characterized by forested slopes, cool, clear streams, and rugged terrain. The southern Blue Ridge is the most floristically diverse ecoregion of the state. Elevations range from 300 to 6,000 ft.

Five community types occur in the Cherokee National Forest where the four alternatives are proposed; mesic deciduous forest, eastern hemlock and white pine forest, oak and oak-pine forest, pine and pine-oak forest, and grass/forb communities.

Because of thin soils and the numerous steep slopes and ridge tops, the upper slope forest communities are **oak and oak-pine forest and pine and pine-oak forests**. Species sharing the canopy include chestnut oak, hemlock, persimmon, sassafras, scarlet oak,

shortleaf pine, sourwood, Virginia pine and white oak. Other species in this forest include blueberry, bracken fern, columbine, huckleberry, mountain laurel, and wandflower.

Communities of **mesic deciduous forest and eastern hemlock and white pine forests** occur on the lower slopes, in narrow valleys and along streams. Dominant tree species found along the proposed routes include basswood, beech, black cherry, black locust, flowering dogwood, Fraser's magnolia, hemlock, red maple, sassafras, sourwood, sweet gum, tulip poplar, umbrella magnolia, yellow buckey,e and white pine. Shrubs, vines, and herbs in this forest include alder, Christmas fern, hydrangea, maple-leaf viburnum, cross vine, Dutchman's pipe, foam flower, maidenhair fern, muscadine grape, rhododendron, Solomon's seal, sweet shrub, Virginia creeper, wild ginger and witch hazel.

The **grass/forbs** plant community occurs primarily as rights-of-way (ROW), managed fields, and roadsides. These areas are mostly comprised of blackberry, Canada goldenrod, giant ironweed, Joe-Pye weed, multiflora rose, Queen Anne's lace, sericea lespedeza, and smooth oxeye.

Most plant communities encountered along the proposed alternatives are common and representative of the Blue Ridge Mountains. An uncommon community, **Phyllite river-scoured herb** community, occurs on exposed rock outcrops within the Ocoee River and on boulders within the riparian zone of the river. This community consists of a unique assemblage of species, sometimes including the federally listed Ruth's golden aster (*Pityopsis ruthii)*. The four alternatives are not anticipated to impact this uncommon plant community. The proposed TL activities will occur on the steep ridgetops high above the Ocoee River. No project related disturbances would occur in the vicinity of this uncommon community.

No designated critical habitat is located within any of the four alternatives sites.

The proposed Ocoee 2-Ocoee 3 transmission line alternatives can be found within the Ducktown and Caney Creek quadrangle maps in the vicinity of the Ocoee River. No special habitat features including caves, talus, boulders, spray cliffs and waterfalls, or seeps and springs are in the proposed activity area.

Invasive exotic plants present along and immediately adjacent to the proposed Alternatives include Japanese honeysuckle, multiflora rose, privet and tree of heaven. Throughout their range, these species are associated with disturbed areas such as roadsides and woodland edges as well as floodplains, streamsides and riparian zones. Along the access roads and the existing transmission line corridor, the densities of these species and the habitats in which they occur are characteristic of the region.

SPECIES EVALUATED AND METHODS USED

Using information from project area habitat conditions, species habitat requirements, and species distributions and limiting factors, the entire 2001 Cherokee National Forest TES list was reviewed along with the species habitat list to determine if any TES species were likely to occur in or near the project area. The TVA Natural Heritage database maps were examined to locate any records of TES species present in the proposed project area.

Following preliminary screening mentioned above, site-specific inventories of proposed, endangered, threatened, and sensitive species for this project were completed for each

proposed alternative. Aquatic, botanical and terrestrial animal surveys were completed in May 2004 and August and September 2005. Field investigations revealed no occurrences of TES, state-listed or federally listed species within any of the proposed Alternatives.

The botanical surveys were conducted in May 2004 and August and September 2005 in the described project areas. No rare species were found. However, several species may occur in the area but would not have been identified due to the season. In addition, due to the nature of the proposed actions there is potential for previously defined boundaries to be adjusted due to unanticipated circumstances. The botanical surveyors acknowledge that rare species may occur within the project areas and in peripheral areas. In order to address potential impacts to these species, we chose to address these vascular plants in our analysis.

This Biological Evaluation addresses those species that are considered to occur or have habitat on the Cherokee National Forest. Each species, listed in Attachment A, was evaluated and given a Project Review Code (PRC). A key was used (Attachment B) for evaluation. Some of the PRC's are used for a Determination of Effect. Two species of salamander (*Plethodon* sp.) were reviewed but are not described in the text. These species have the potential to occur within the proposed project area based on range and habitat. However, a site specific inventory of the project area did not identify any individuals. Moreover, a DNA analysis is required for identification to the species level. Based on the analysis in Attachment A, the following species require detailed analysis and a determination of effect.

Table 1 lists the species requiring further analysis and a determination of effects based on the analysis in the Project Review Form.

Table 1. Species Requiring Further Analysis

Scientific Name	Common Name
Birds	
Haliaeetus leucocephalus	Bald eagle
Insects	
Speyeria diana	Diana fritillary
Mammals	
Corynorhinus rafinesquii	Rafinesque's big-eared bat
Myotis leibii	Eastern small-footed bat
Myotis sodalist	Indiana bat
Snails	
Fumonelix archeri	Ocoee covert
Vascular Plants	
Aster georgianus	Georgia aster
Berberis canadensis	American barberry
Botrychium jenmanii	Dixie grapefern
Buckleya distichophylla	Piratebush
Delphinium exaltatum	Tall larkspur
Diervilla rivularis	Riverbank bush-honeysuckle
Fothergilla major	Large witchalder
Isotria medeoloides	Small whorled pogonia

Scientific Name	Common Name
Lysimachia fraseri	Fraser's yellow loosestrife
Monotropsis odorata	Sweet pinesap
Penstemon smallii	Small's beardtongue
Pycnanthemum beadlei	Beadle's mountain mint
Sedum nevii	Nevius' stonecrop
Thaspium pinnatifidum	Cutleaved meadow parsnip
Thermopsis mollis var. fraxinifolia	Ashleaf goldenbanner
Tsuga caroliniana	Carolina hemlock

HABITAT RELATIONSHIPS

***Haliaeetus leucocephalus* Bald eagle**
Bald eagles nest from Alaska to the eastern coast of Canada and south along the coast to Florida. They are also known to nest along lakes and rivers in non-costal states in the southeast. This nest is approximately 2.2 miles from the proposed project area. An eagle nest was discovered on Parksville Lake, Polk County, Tennessee in 2006. Bald eagles typically nest near large bodies of water including lakes, rivers, and riparian wetlands. They form small to large roosts in the same habitats during the winter. Bald eagles normally produce their first young at four or five years of age, shortly after molting into adult plumage. Egg-laying dates extend from early February through late April and peak about 20 February in Tennessee (Floyd 1990), though egg-laying in November and December is also known for the region (Ganier 1931; Spofford 1948). Bald eagle numbers were greatly reduced in the southeast in the mid-1900s due to the use of DDT and direct persecution. In recent years, bald eagle numbers have greatly increased throughout the area.

***Speyaria diana* Diana fritillary**
The original range of this species was possibly as far north as western Pennsylvania; presently it ranges to the Virginias. To the west, its range was formerly mostly through the Ohio Valley to Illinois, and south to northern Louisiana and north Georgia, though distribution has been somewhat spotty. Diana fritillary is currently very rare outside of Appalachia. This species has been found recently primarily in the mountains from central Virginia and West Virginia through the western Carolinas and eastern Tennessee into extreme northern Georgia and adjacent Alabama (NatureServe 2006). Habitat for this species includes glades and other open areas within rich, moist mountain forests (Glassberg 1999). The Diana fritillary routinely lays eggs near violets, the larvae's host food. The caterpillars hatch, hibernate over the winter as pupae, and then crawl to nearby violets in the springtime (P. Lambdin personal communication). Adults are present from late June to September with males emerging before females. One brood is produced per year.

***Corynorhinus rafinesquii* Rafinesque's big-eared bat**
This species ranges widely over the southern states from Virginia, West Virginia, Ohio, Indiana, and Illinois south to the Gulf of Mexico; west to Louisiana, Oklahoma, and eastern Texas. It inhabits forested regions. Hibernation in the north and in mountainous regions most often occur in caves or similar sites; small caves are selected, and the bats stay near the entrance (often within 30 meters) and are thought to move about in winter. Winter habitat in the south is not well known. Summer roosts often are in hollow trees,

occasionally under loose bark, or in abandoned buildings in or near wooded areas, instead of being restricted to caves (NatureServe 2006).

***Myotis leibii* Eastern small-footed bat**
This species is found in rocky mountainous areas from Quebec southwest along the Southern Appalachians to northern Georgia, and west to Oklahoma. Abundance is extremely difficult to assess, and populations and occurrences are relatively scattered and small throughout its range (Erdle and Hobson 2001). In 350 nights of mist netting across the CNF since 1991, only 12 individuals have been recorded and banded in Polk, Monroe, Cocke, Unicoi, and Greene Counties. Several bachelor colonies and two maternity colonies have been observed in bridges, mines and rock crevices during the period 2000-2003 (G. Libby, Pers. comm.). Summer roosts include rock outcrops and cliffs, rock faults and crevices, bridge expansion joints, and abandoned mines and buildings. Rocky areas or bridges with sun exposure in a forested landscape may be important maternity site features. These bats hibernate singly or in small groups in caves, mines and buildings and are often found under talus and rocks on cave floors or wedged into cracks and crevices. Known threats include direct human disturbance of roosts, and landscape changes that alter habitat parameters of roosts or hibernacula. Snag retention is important.

***Myotis sodalis* Indiana bat**
The distribution of Indiana bats is generally associated with limestone caves in the eastern U.S. (Menzel et al. 2001). Within this range, the bats occupy two distinct types of habitat. During summer months, maternity colonies roost under sloughing bark of dead and partially dead trees of many species, often in forested settings (Callahan et al. 1997). Reproductive females require multiple alternate roost trees to fulfill summer habitat needs. Adults forage on winged insects within three miles of the occupied maternity roost. Swarming of both males and females and subsequent mating activity occurs at cave entrances prior to hibernation (MacGregor et al. 1999). During this autumn period, bats roost under sloughing bark and in cracks of dead, partially dead and live trees.

***Fumonelix archeri* Ocoee covert**
Ocoee coverts are known from the Ocoee watershed in Polk County, Tennessee. The TVA Natural Heritage database lists two populations in or near the Ocoee River, but seven new sites for this species are currently known (D. Doursen, Pers. comm.) This species is found under the leaf litter in hardwood forests, especially in areas with dog hobble (*Leucothoe fontanesiana*).

***Aster georgianus* Georgia aster**
This species is known to occur from central North Carolina, south to central Georgia and Alabama. Disjunct populations occur in Florida. This species is not currently known to occur on the Cherokee National Forest, but is possible in southeastern Tennessee. Habitats are described as dry, rocky, open woods and roadsides in areas that probably had a previous history of periodic fire. This species is considered to be associated with historic post oak and blackjack oak woodlands (Weakley 2006).

***Berberis canadensis* American barberry**
American barberry ranges from Pennsylvania south to Alabama and Georgia and west as far as Missouri. Considered rare south of Virginia, this species is a broad southern Appalachian Ozarkian endemic. American barberry is generally known from open rocky woods, openings, and streambanks, usually over mafic or calcareous rock (Weakley 2006).

Formerly an inhabitant of savannas and open woodlands, fire suppression has significantly restricted its habitat to sites with shallow soil (such as glades and cliffs) or areas with mowing or other canopy-clearing activities (such as powerline corridors, railroad/road right-of-ways and riverbanks). No locations for this plant are currently recorded for the Cherokee National Forest.

***Botrychium jenmanii* Dixie grapefern**
This plant ranges from Virginia south to Florida through Tennessee, Alabama, and Louisiana. Like most other grapeferns, specific habitat is difficult to categorize, and may include dry to moist forests and disturbed areas. It occurs in a variety of habitats including hardwoods, pine woods, open grassy places, and disturbed areas and is rare across most of its range. No locations for this plant are currently recorded for the Cherokee National Forest.

***Buckleya distichophylla* Piratebush** and ***Tsuga caroliniana* Carolina hemlock**
These are both southern Appalachian endemics that often occur together on open, dry, rocky bluffs. Piratebush is only known to occur at a few, widely scattered locations in the mountains of southern Virginia, western North Carolina, and eastern Tennessee (Weakley 2006). There are currently 14 known sites for this species on the Cherokee National Forest. Carolina hemlock is known from over 50 locations on the forest and ranges from Virginia, south through Tennessee and North Carolina, to northern portions of Georgia and South Carolina (Weakley 2006).

***Delphinium exaltatum* Tall larkspur**
This larkspur is known to occur primarily west of the Blue Ridge Mountains from southwest Pennsylvania and Ohio, to Missouri, then east to eastern Tennessee, the Mountains of southern Virginia, and the Mountains and Piedmont of North Carolina. The species occurs in dry to moist habitats over calcareous or mafic rock, usually in full or partial sun, often on forest edges or within grassy balds (Weakley 2006). The flowers are a pale to medium blue and occur July (low elevations) to September (high elevations). No locations for this species are recorded on the Cherokee National Forest.

***Diervilla rivularis* Riverbank bush-honeysuckle**
This species is found in western North Carolina, east Tennessee south to northwest Georgia and northeast Alabama. It grows on rock outcrops, ridges and streambanks at moderate to high elevations. It flowers from June to August (Weakley 2006). There are currently 12 known occurrences on the Cherokee National Forest.

***Fothergilla major* Large witchalder**
This species ranges from Arkansas east to Tennessee, Alabama, Georgia, and the Carolinas. It is typically found in dry, ridgetop forests of moderate elevations especially along the Blue Ridge escarpment (Weakley 2006). There are currently three known occurrences of this species on the Cherokee National Forest.

***Isotria medeoloides* Small whorled pogonia**
This federally threatened orchid occurs sporadically with a primary range extending from southern Maine and New Hampshire through the Atlantic Seaboard states to northern Georgia and southeastern Tennessee. Outlying colonies have been found in the western half of Pennsylvania, Ohio, Michigan, Illinois, and Ontario, Canada (USFWS 1992). Known populations are sometimes separated by long distances, occasionally hundreds of miles. Small whorled pogonia occurs in acidic soils, in dry to mesic second-growth, deciduous or

deciduous-coniferous forests; typically with moderate to light leaf litter, with sparse to moderate ground cover (except when among ferns), a moderate to light shrub layer, and relatively open canopy (USFWS 1992). It has been observed that this species occurs in proximity to logging roads, streams, or other features that create long persisting breaks in the forest canopy (USFWS 1992). Typical canopy species associated with small whorled pogonia in its southern range include chestnut oak, red maple, tulip poplar, white oak and white pine (USFWS 1992). Understory trees and shrubs in the southern part of the range include flowering dogwood, mountain laurel, sourwood, witch-hazel and, in the mountains, flame azalea (USFWS 1992). Typical ground layer species found throughout its range include Indian cucumber root, lowbush blueberry, New York fern, partridge berry, and rattlesnake plantain with cat-brier, Christmas fern and Virginia creeper primarily being found in its southern range (USFWS 1992). It is believed that part of the reason for this orchid's rarity is the tendency of individual plants to remain dormant for very long periods of time (Weakley 2006). There are two populations known in Tennessee from Hamilton and Washington Counties. There are no known populations recorded on the Cherokee National Forest.

***Lysimachia fraseri* Fraser's loosestrife**
Fraser's loosestrife is a regional endemic, occurring in eastern Tennessee, the Carolinas, Alabama, and Georgia with disjunct populations in southern Illinois and northwestern Tennessee. This species is known from hardwood forests, forest edges, roadbanks, and thin soils near rock outcrops. *Lysimachia fraseri* is generally found in wet areas such as alluvial meadows, moist stream and riverbanks, flats along streams, moist pastures, and roadside ditches, yet it is also known from rocky upland and hardwood forests. Flowering seems dependent upon treefall gaps or other openings in the canopy (Weakley 2006). There are currently 10 known populations recorded on the Cherokee National Forest.

***Monotropsis odorata* Sweet pinesap**
This plant ranges from Maryland and West Virginia south to Georgia and Alabama, though it seems to be centered in the Appalachians (Weakley 2006). On the Cherokee National Forest, this species typically inhabits dry to mesic pine and mixed pine-hardwood woodlands. This species is mycotrophic (deriving its nutrition from another vascular plant via fungal hyphae) thus, the distribution of this species may be tied, in part, to the distribution of certain fungi and other vascular plants (Olson 1994). Where found, populations often occupy only a few square meters, thus only a tiny fraction of available habitat is utilized. Although it has a wide distribution and non-specific habitat, it remains an extremely rare plant throughout its range. There are currently eight known sites for this species on the Cherokee National Forest.

***Penstemon smallii* Small's beardtongue**
This species is a southern Appalachian endemic that occurs in woodlands, cliffs, glades, and roadsides from northwest North Carolina and northeast Tennessee, south to northwest South Carolina and northern Georgia (Weakley 2006). There are currently no records of this species on the Cherokee National Forest.

***Pycnanthemum beadlei* Beadle's mountain mint**
Beadle's mountain mint is a southern Appalachian endemic that is known to occur in forests and woodland borders from southwest Virginia and northeast Tennessee to southwest North Carolina and northwest South Carolina and north Georgia (Weakley 2006). There are currently no documented sites for this species on the Cherokee National Forest.

***Sedum nevii* Nevius' stonecrop**
This species is endemic to southeast Tennessee (Polk County), north central and east central Alabama and west central Georgia. It occurs on gneiss rock outcrops on river bluffs (Weakley 2006). There are currently nine records known on the Cherokee national Forest, all restricted to the Ocoee River gorge.

***Thaspium pinnatifidum* Cutleaved meadow parsnip**
This species is known from Kentucky and Ohio, south to western North Carolina, eastern Tennessee and northern Alabama where it occurs in forests and woodlands over calcareous rock (Weakley 2006). There is currently one documented site for this species on the Cherokee National Forest.

***Thermopsis mollis var. fraxinifolia* Ashleaf goldenbanner**
Thermopsis mollis var. fraxinifolia is a southern Appalachian endemic that ranges from North Carolina and Tennessee, south to northern portions of Georgia and South Carolina. Habitat includes openings in dry woodlands and ridges (Weakley 2006). There are currently 28 known sites for this species on the Cherokee National Forest, many of which occur along roadsides.

EFFECTS

Direct and Indirect Effects

Alternative 1 – Rebuild Ocoee 2-Ocoee 3 Transmission Line in Place

***Haliaeetus leucocephalus* Bald eagle**
An active bald eagle nest is known to exist approximately 2.2 miles from the existing Ocoee #2 – Ocoee #3 transmission line. The distance is beyond the protective zones designated by the United State Fish and Wildlife Service (USFWS). Impacts to this nest are not expected from ground-work within the ROW. However, equipment and materials may be transported to some segments of this transmission line by helicopter. Aerial fly-overs are necessary to support construction activities along the corridor and have the potential to impact this nest. Helicopters or other low-level aircraft are restricted from an area 0.5 miles around the nest within January 1-June 31 under USFWS guidelines. TVA will fully comply with these restrictions in order to prevent impacts to bald eagles. With this commitment, the proposed actions are not likely to adversely affect bald eagles or their nest. Formal consultation with the USFWS is not required. Informal consultation was conducted on August 16, 2006. The USFWS concurs with the restriction.

***Speyeria diana* Diana fritillary**
The proposed actions may cause temporary and local impacts to Diana fritillary habitat in areas where access roads will be upgraded. A possible result of road grading is the temporary loss of violets along roads. Violet populations beyond roads will not be affected and thus Diana fritillary food-plants will not be lost from the area. The proposed project area includes abundant Diana fritillary habitat which will not be affected by the proposed actions. The proposed actions are not likely to adversely affect Diana fritillaries.

***Corynorhinus rafinesquii* Rafinesque's big-eared bat**
No caves, mines, or old buildings providing suitable conditions for Rafinesque's big-eared bat are known to occur within the proposed project site. Big-eared bats are not likely to occur within the existing ROW. If bats are present, individuals may be flushed from their

roosts. This would result in a temporary movement from the area, but mortality is not likely. Habitat would not be modified upon completion of Alternative 1. The implementation of Alternative 1 is not likely to adversely affect big-eared bats or their habitat.

***Myotis leibii* Eastern small-footed bat**
No caves, mines, or old buildings with suitable conditions for eastern small-footed bat are known to occur within the proposed project site. Eastern small-footed bats are not likely to occur within the existing ROW. If bats are present, individuals may be flushed from their roosts. This would result in a temporary movement from the area, but mortality is not likely. Habitat would not be modified upon completion of Alternative 1. The implementation of Alternative 1 is not likely to adversely affect small-footed bats or their habitat.

***Myotis sodalis* Indiana bat**
Indiana bats are not known from Polk County but have been found in adjacent counties. Excellent habitat for Indiana bats occurs nearby, just south of Deep Gap. TVA biologists conducted field studies during May 26 – June 2, 1998 to determine if Indiana bats were present in the area during the maternity season. No Indiana bats were captured during mist net surveys. Although this study could not exclude the presence of Indiana bats from the site, it was determined that this area does not support significant populations of Indiana bats. No suitable hibernacula (caves, mines, old buildings) are known to occur within or near the project site. Much of the habitat adjacent to the existing ROW largely consists of yellow pines on dry, ridge-tops. This habitat ranks as low quality using Indiana Bat Suitability habitat indexes. Alternative 1 is not likely to adversely affect the Indiana bat. Formal consultation with the USFWS is not required. Informal consultation was conducted on August 16, 2006. The USFWS concurs with this finding.

***Fumonelix archeri* Ocoee covert**
A loss of forest cover would contribute to the drying of the forest floor which would adversely impact snails. Since Alternative 1 would not create losses in forest cover, it is not likely to adversely affect the Ocoee covert.

***Aster georgianus* Georgia aster**
The proposed actions may cause temporary and local impacts to this species. Alternative 1 offers potential habitat for the Georgia aster and is described as dry, rocky, open woods and roadsides in areas that probably had a previous history of periodic fire. Small local disturbances will not cause significant impacts to populations occurring throughout the proposed alternative. Populations beyond the existing ROW, laydown areas and access areas will not be affected.

***Berberis canadensis* American barberry**
The proposed actions may cause temporary and local impacts to this species. Alternative 1 provides potential habitat for the American barberry and is described as open rocky woods, openings, and streambanks, or areas with mowing or other canopy-clearing activities (such as powerline corridors, railroad/road right-of-ways and riverbanks). Small local disturbances will not cause significant impacts to populations occurring throughout the proposed alternative. Populations beyond the existing ROW, laydown areas and access areas will not be affected.

***Botrychium jenmanii* Dixie grapefern**
The proposed actions may cause temporary and local impacts to the dixie grapefern. Alternative 1 provides potential habitat for this species including hardwoods, pine woods,

open grassy places, and disturbed areas. Small local disturbances will not cause significant impacts to populations occurring throughout the proposed alternative. Populations beyond the existing ROW, laydown areas and access areas will not be affected.

***Buckleya distichophylla* Piratebush** and ***Tsuga caroliniana* Carolina hemlock**
The proposed actions may cause temporary and local impacts to these species. Habitat for both piratebush and the Carolina hemlock are not abundant in the proposed alternative route and include open, dry, rocky bluffs. Small local disturbances will not cause significant impacts to populations occurring throughout Alternative 1. Populations beyond the existing ROW, laydown areas and access areas will not be affected.

***Delphinium exaltatum* Tall larkspur**
The proposed actions may cause temporary and local impacts to this species. Alternative 1 offers potential habitat for the tall larkspur which includes dry to moist habitats over calcareous or mafic rock, usually in full or partial sun, often on forest edges or within grassy balds. Small local disturbances will not cause significant impacts to populations occurring throughout the proposed alternative. Populations beyond the existing ROW, laydown areas and access areas will not be affected.

***Diervilla rivularis* Riverbank bush honeysuckle** and ***Sedum nevii* Nevius' stonecrop**
The proposed actions may cause temporary and local impacts to these species. Habitat for both riverbank bush honeysuckle and Nevius' stonecrop are not abundant in the proposed alternative route and include river bluffs, shaded cliffs and rock outcrops. Small local disturbances will not cause significant impacts to populations occurring throughout Alternative 1. Populations beyond the existing ROW, laydown areas and access areas will not be affected.

***Fothergilla major* Large witchalder**
The proposed actions may cause temporary and local impacts to the large witchalder. Alternative 1 provides potential habitat for this species including dry woods and balds. Small local disturbances will not cause significant impacts to populations occurring throughout the proposed alternative. Populations beyond the existing ROW, laydown areas and access areas will not be affected.

***Isotria medeoloide*s Small whorled pogonia**
Small whorled pogonia is not known from Polk County but is found in an adjacent county in Georgia. According to the USFWS Recovery Plan for *Isoetes medeoloides,* this species is not restricted to uncommon or unique forest habitat types. It has been found in areas described as upland sites in mixed-deciduous or mixed-deciduous/coniferous forests that are generally in second- or third- growth successional stages. Soils are described as highly acidic with moderately high soil moisture levels. Typical canopy species associated with small whorled pogonia in its southern range include chestnut oak, red maple, tulip poplar, white oak and white pine (USFWS 1992). Understory trees and shrubs in the southern part of the range include flowering dogwood, mountain laurel, sourwood, witch-hazel and, in the mountains, flame azalea (USFWS 1992). Typical ground layer species found throughout its range include Indian cucumber root, lowbush blueberry, New York fern, partridge berry, and rattlesnake plantain with cat-brier, Christmas fern and Virginia creeper primarily being found in its southern range (USFWS 1992). Based on the lack of documented records of this species in Polk County, it is unlikely for small whorled pogonia to occur within the proposed

project area. Formal consultation with the USFWS is not required. Informal consultation was conducted on August 16, 2006. The USFWS concurs with this finding.

***Lysimachia fraseri* Fraser's loosestrife**
The proposed actions may cause temporary and local impacts to this species. Potential habitat is widespread within the proposed Alternative and is described as hardwood forests, forest edges, roadbanks, and thin soils near rock outcrops. Small local disturbances will not cause significant impacts to populations occurring throughout the proposed alternative. Populations beyond the existing ROW, laydown areas and access areas will not be affected.

***Monotropsis odorata* Sweet pinesap**
The proposed actions may cause temporary and local impacts to sweet pinesap. Potential habitat for this species is widespread within the proposed Alternative and includes dry to mesic pine and mixed pine-hardwood woodlands. Small local disturbances will not cause significant impacts to populations occurring throughout the proposed alternative. Populations beyond the existing ROW, laydown areas and access areas will not be affected.

***Penstemon smallii* Small's beardtongue**
The proposed actions may cause temporary and local impacts to this species. Habitat for Small's beardtongue is widespread within the proposed alternative. Small local disturbances will not cause significant impacts to populations occurring throughout the proposed project area. Populations beyond the existing ROW, laydown areas and access areas will not be affected.

***Pycnanthemum beadlei* Beadle's mountain mint**
The proposed actions may cause temporary and local impacts to this species. Habitat for Beadle's mountain mint is widespread within the proposed alternative. Small local disturbances will not cause significant impacts to populations occurring throughout the proposed project area. Populations beyond the existing ROW, laydown areas and access areas will not be affected.

***Thaspium pinnatifidum* Cutleaved meadow parsnip**
The proposed actions may cause temporary and local impacts to the cutleaved meadow parsnip. Habitat is widespread within the proposed alternative. Small local disturbances will not cause significant impacts to populations occurring throughout the proposed project area. Populations beyond the existing ROW, laydown areas and access areas will not be affected.

***Thermopsis mollis var. fraxinifolia* Ashleaf goldenbanner**
The proposed actions may cause temporary and local impacts to this species. Habitat for ashleaf goldenbanner is widespread within the proposed alternative. Small local disturbances will not cause significant impacts to populations occurring throughout the proposed project area. Populations beyond the existing ROW, laydown areas and access areas will not be affected.

Alternative 2 – Build Ocoee 2-Ocoee 3 Transmission Line Using New Right-of-Way and Portions of Existing Right-of-Way

***Haliaeetus leucocephalus* Bald eagle**
An active bald eagle nest is known to exist approximately 2.2 miles from the existing Ocoee #2 – Ocoee #3 transmission line. The distance is beyond the protective zones designated by the United State Fish and Wildlife Service (USFWS) to protect bald eagles. Impacts to this nest are not expected from ground-work within the ROW. However, equipment and materials may be transported to some segments of this transmission line by helicopter. Aerial fly-overs necessary to support construction activities along the corridor have the potential to impact this nest. Helicopters or other low-level aircraft are restricted from an area 0.5 miles around the nest within January 1-June 31 under USFWS guidelines. TVA will fully comply with these restrictions in order to prevent impacts to bald eagles. With this commitment, the proposed actions are not likely to adversely affect bald eagles or their nest. Formal consultation with the USFWS is not required. Informal consultation was conducted on August 16, 2006. The USFWS concurs with the restriction.

***Speyeria diana* Diana fritillary**
The proposed actions may cause temporary and local impacts to Diana fritillary habitat in areas where access roads will be upgraded and potentially along and near the existing ROW. A possible result of road grading is the temporary loss of violets along roads. Violet populations beyond roads would not be affected and thus Diana fritillary food-plants would not be lost from the area. The proposed project area includes abundant Diana fritillary habitat which would not be affected by the proposed actions. The proposed actions are not likely to adversely affect Diana fritillaries.

***Corynorhinus rafinesquii* Rafinesque's big-eared bat**
No caves, mines, or old buildings providing suitable conditions for Rafinesque's big-eared bat are known to occur within the project site. Big-eared bats are not likely to occur within the proposed transmission line ROW. If bats are present, individuals may be flushed from their roosts. This would result in a temporary movement from the area, but mortality is not likely. Since much of the ROW would include already existing ROW, very little potential habitat is expected to be affected. The implementation of Alternative 2 is not likely to adversely affect big-eared bats or their habitat.

***Myotis leibii* Eastern small-footed bat**
No caves, mines, or old buildings with suitable conditions for eastern small-footed bat are known to occur within the project site. Eastern small-footed bats are not likely to occur within the transmission line ROW. If bats are present, individuals may be flushed from their roosts. This would result in a temporary movement from the area, but mortality is not likely. Since much of the ROW would include already existing ROW, very little potential habitat is expected to be affected. The implementation of Alternative 2 is not likely to adversely affect eastern small-footed bats or their habitat.

***Myotis sodalis* Indiana bat**
Indiana bats are not known from Polk County but have been found in adjacent counties. Excellent habitat for Indiana bats occurs nearby, just south of Deep Gap. TVA biologists conducted field studies during May 26 – June 2, 1998 to determine if Indiana bats were present in the area during the maternity season. No Indiana bats were captured during mist net surveys. Although this study could not exclude the presence of Indiana bats from the site, it was determined that this area does not support significant populations of Indiana bats. No suitable hibernacula (caves, mines, old buildings) are known to occur within or near the project site. Much of the habitat adjacent to the existing ROW largely consists of yellow pines on dry, ridge-tops. This habitat ranks as low quality using Indiana Bat

Suitability habitat indexes. Alternative 2 is not likely to adversely affect the Indiana bat. Formal consultation with the USFWS is not required. Informal consultation was conducted on August 16, 2006. The USFWS concurs with this finding.

***Fumonelix archeri* Ocoee covert**
Ocoee coverts would not be adversely affected in areas of existing ROW. A loss of forest cover in new ROW will contribute to the drying of the forest floor which would adversely impact snails. Ocoee coverts are not likely to be located on dry ridges but may exist in wet ravines. Ravines will be spanned which would minimize or eliminate impacts to these areas. Although in cases where large trees will be removed from within ravines, Ocoee coverts may be impacted. These impacts will only affect a small portion of the potential habitat found throughout Polk County. None of the known populations of Ocoee covert will be impacted by the proposed actions. To reduce potential impacts, TVA will strictly adhere to the RLRMP and Best Management Practices (BMPs) as outlined in Muncy (1999) where the proposed ROW crosses streams and where it crosses the Ocoee River. The proposed actions will not adversely affect Ocoee coverts with the use of BMPs and adherence to the RLRMP.

***Aster georgianus* Georgia aster**
The proposed actions may cause temporary and local impacts to this species. Alternative 2 offers potential habitat for the Georgia aster and is described as dry, rocky, open woods and roadsides in areas that probably had a previous history of periodic fire. Small local disturbances will not cause significant impacts to populations occurring throughout the proposed alternative. Populations beyond the existing ROW, laydown areas and access areas will not be affected.

***Berberis canadensis* American barberry**
The proposed actions may cause temporary and local impacts to this species. Alternative 2 provides potential habitat for the American barberry and is described as open rocky woods, openings, and streambanks, or areas with mowing or other canopy-clearing activities (such as powerline corridors, railroad/road right-of-ways and riverbanks). Small local disturbances will not cause significant impacts to populations occurring throughout the proposed alternative. Populations beyond the existing ROW, laydown areas and access areas will not be affected.

***Botrychium jenmanii* Dixie grapefern**
The proposed actions may cause temporary and local impacts to the dixie grapefern. Alternative 2 provides potential habitat for this species including hardwoods, pine woods, open grassy places, and disturbed areas. Small local disturbances will not cause significant impacts to populations occurring throughout the proposed alternative. Populations beyond the existing ROW, laydown areas and access areas will not be affected.

***Buckleya distichophylla* Piratebush** and ***Tsuga caroliniana* Carolina hemlock**
The proposed actions may cause temporary and local impacts to these species. Habitat for both piratebush and the Carolina hemlock are not abundant in the proposed alternative route and include open, dry, rocky bluffs. Small local disturbances will not cause significant impacts to populations occurring throughout Alternative 2. Populations beyond the existing ROW, laydown areas and access areas will not be affected.

***Delphinium exaltatum* Tall larkspur**

The proposed actions may cause temporary and local impacts to this species. Alternative 2 offers potential habitat for the tall larkspur which includes dry to moist habitats over calcareous or mafic rock, usually in full or partial sun, often on forest edges or within grassy balds. Small local disturbances will not cause significant impacts to populations occurring throughout the proposed alternative. Populations beyond the existing ROW, laydown areas and access areas will not be affected.

***Diervilla rivularis* Riverbank bush honeysuckle** and ***Sedum nevii* Nevius' stonecrop**
The proposed actions may cause temporary and local impacts to these species. Habitat for both riverbank bush honeysuckle and Nevius' stonecrop are not abundant in the proposed alternative route and include river bluffs, shaded cliffs and rock outcrops. Small local disturbances will not cause significant impacts to populations occurring throughout Alternative 2. Populations beyond the existing ROW, laydown areas and access areas will not be affected.

***Fothergilla major* Large witchalder**
The proposed actions may cause temporary and local impacts to the large witchalder. Alternative 2 provides potential habitat for this species including dry woods and balds. Small local disturbances will not cause significant impacts to populations occurring throughout the proposed alternative. Populations beyond the existing ROW, laydown areas and access areas will not be affected.

***Isotria medeoloide*s Small whorled pogonia**
Small whorled pogonia is not known from Polk County but is found in an adjacent county in Georgia. According to the USFWS Recovery Plan for *Isoetes medeoloides,* this species is not restricted to uncommon or unique forest habitat types. It has been found in areas described as upland sites in mixed-deciduous or mixed-deciduous/coniferous forests that are generally in second- or third- growth successional stages. Soils are described as highly acidic with moderately high soil moisture levels. In its southern range, common canopy species include chestnut oak, red maple, tulip poplar, white oak and white pine (USFWS 1992). Understory trees and shrubs in the southern part of the range include flowering dogwood, mountain laurel, sourwood, witch-hazel and, in the mountains, flame azalea (USFWS 1992). Typical ground layer species found throughout its range include Indian cucumber root, lowbush blueberry, New York fern, partridge berry, and rattlesnake plantain with cat-brier, Christmas fern and Virginia creeper primarily being found in its southern range (USFWS 1992). Based on the lack of documented records of this species in Polk County, it is unlikely for small whorled pogonia to occur within the proposed project area. Formal consultation with the USFWS is not required. Informal consultation was conducted on August 16, 2006. The USFWS concurs with this finding.

***Lysimachia fraseri* Fraser's loosestrife**
The proposed actions may cause temporary and local impacts to this species. Potential habitat is widespread in the Cherokee National Forest and is described as hardwood forests, forest edges, roadbanks, and thin soils near rock outcrops. Small local disturbances will not cause significant impacts to populations occurring throughout the proposed alternative. Populations beyond the new and existing ROW, laydown areas and access areas will not be affected.

***Monotropsis odorata* Sweet pinesap**
The proposed actions may cause temporary and local impacts to sweet pinesap. Potential habitat for this species is widespread in the Cherokee National Forest including dry to

mesic pine and mixed pine-hardwood woodlands. Small local disturbances will not cause significant impacts to populations occurring throughout the proposed alternative. Populations beyond the new and existing ROW, laydown areas and access areas will not be affected.

***Penstemon smallii* Small's beardtongue**
The proposed actions may cause temporary and local impacts to this species, though it is not currently known to occur on the Cherokee National Forest. Habitat for Small's beardtongue is widespread within the proposed alternative. Small local disturbances will not cause significant impacts to populations occurring throughout the proposed project area. Populations beyond the new and existing ROW, laydown areas and access areas will not be affected.

***Pycnanthemum beadlei* Beadle's mountain mint**
The proposed actions may cause temporary and local impacts to this species, though this species is not currently known to occur on the Cherokee National Forest. Habitat for Beadle's mountain mint is widespread within the proposed alternative. Small local disturbances will not cause significant impacts to populations occurring throughout the proposed project area. Populations beyond the new and existing ROW, laydown areas and access areas will not be affected.

***Thaspium pinnatifidum* Cutleaved meadow parsnip**
The proposed actions may cause temporary and local impacts to the cutleaved meadow parsnip. Habitat is widespread within the proposed Alternative. Small local disturbances will not cause significant impacts to populations occurring throughout the proposed project area. Populations beyond the new and existing ROW, laydown areas and access areas will not be affected.

***Thermopsis mollis var. fraxinifolia* Ashleaf goldenbanner**
The proposed actions may cause temporary and local impacts to this species. Habitat for ashleaf goldenbanner is widespread within the proposed alternative. Small local disturbances will not cause significant impacts to populations occurring throughout the project area. Populations beyond the new and existing ROW, laydown areas and access areas will not be affected.

Alternative 3 – No Action
Under the No Action Alternative, TVA would essentially have to rebuild the transmission line over a period of approximately 10 years. The No Action Alternative includes gradual actions such as line maintenance with eventual rebuilding activities.

***Haliaeetus leucocephalus* Bald eagle**
An active bald eagle nest is known to exist approximately 2.2 miles from the existing Ocoee #2 – Ocoee #3 transmission line. The distance is beyond the protective zones designated by the United State Fish and Wildlife Service (USFWS) to protect bald eagles. Impacts to this nest are not expected from ground-work within the ROW. However, equipment and materials may be transported to some segments of this transmission line by helicopter. Aerial fly-overs necessary to support construction activities along the corridor have the potential to impact this nest. Helicopters or other low-level aircraft are restricted from an area 0.5 miles around the nest within January 1-June 31 under USFWS guidelines. TVA will fully comply with these restrictions in order to prevent impacts to bald eagles. With this

commitment, the proposed actions are not likely to adversely affect bald eagles or their nest. Formal consultation with the USFWS is not required. Informal consultation was conducted on August 16, 2006. The USFWS concurs with the restriction.

***Speyeria diana* Diana fritillary**
The proposed actions may cause temporary and local impacts to Diana fritillary habitat in areas where access roads will be upgraded and potentially along the existing ROW. A possible result of road grading is the temporary loss of violets along roads. Violet populations beyond roads and the ROW would not be affected and thus Diana fritillary food-plants would not be lost from the area. The proposed project area includes abundant Diana fritillary habitat which would not be affected by the proposed actions. The proposed actions are not likely to adversely affect Diana fritillaries.

***Corynorhinus rafinesquii* Rafinesque's big-eared bat**
No caves, mines, or old buildings providing suitable conditions for Rafinesque's big-eared bat are known to occur within the project site. Big-eared bats are not likely to occur within the existing ROW. If bats are present, individuals may be flushed from their roosts. This would result in a temporary movement from the area, but mortality is not likely. Habitat would not be modified upon completion of Alternative 3. The implementation of Alternative 3 is not likely to adversely affect big-eared bats or their habitat.

***Myotis leibii* Eastern small-footed bat**
No caves, mines, or old buildings with suitable conditions for eastern small-footed bat are known to occur within the project site. Eastern small-footed bats are not likely to occur within the existing ROW. If bats are present, individuals may be flushed from their roosts. This would result in a temporary movement from the area, but mortality is not likely. Habitat would not be modified upon completion of Alternative 3. The implementation of Alternative 3 is not likely to adversely affect eastern small-footed bats or their habitat.

***Myotis sodalis* Indiana bat**
Indiana bats are not known from Polk County but have been found in adjacent counties. Excellent habitat for Indiana bats occurs nearby, just south of Deep Gap. TVA biologists conducted field studies during May 26 – June 2, 1998 to determine if Indiana bats were present in the area during the maternity season. No Indiana bats were captured during mist net surveys. Although this study could not exclude the presence of Indiana bats from the site, it was determined that this area does not support significant populations of Indiana bats. No suitable hibernacula (caves, mines, old buildings) are known to occur within or near the project site. Much of the habitat adjacent to the existing ROW largely consists of yellow pines on dry, ridge-tops. This habitat ranks as low quality using Indiana Bat Suitability habitat indexes. Alternative 3 is not likely to adversely affect the Indiana bat. Formal consultation with the USFWS is not required. Informal consultation was conducted on August 16, 2006. The USFWS concurs with this finding.

***Fumonelix archeri* Ocoee covert**
A loss of forest cover would contribute to the drying of the forest floor which would adversely impact snails. Since Alternative 3 would not create losses in forest cover, it is not likely to adversely affect the Ocoee covert.

***Aster georgianus* Georgia aster**
The proposed actions may cause temporary and local impacts to this species. Small local disturbances will not cause significant impacts to populations occurring throughout the

proposed alternative. Populations beyond the existing ROW and access areas will not be affected.

***Berberis canadensis* American barberry**
The proposed actions may cause temporary and local impacts to this species. Small local disturbances will not cause significant impacts to populations occurring throughout the proposed alternative. Populations beyond the existing ROW and access areas will not be affected.

***Botrychium jenmanii* Dixie grapefern**
The proposed actions may cause temporary and local impacts to the dixie grapefern. The transmission line has potential habitat for this species. Small local disturbances will not cause significant impacts to populations occurring throughout the proposed project area.

***Buckleya distichophylla* Piratebush** and ***Tsuga caroliniana* Carolina hemlock**
The proposed actions may cause temporary and local impacts to these species. Habitat for both piratebush and the Carolina hemlock are not abundant in the proposed alternative route and include open, dry, rocky bluffs. Small local disturbances will not cause significant impacts to populations occurring throughout Alternative 3. Populations beyond the existing ROW and access areas will not be affected.

***Delphinium exaltatum* Tall larkspur**
The proposed actions may cause temporary and local impacts to this species. Potential habitat for the tall larkspur is common within the right-of-way. Small local disturbances will not cause significant impacts to populations occurring throughout the proposed alternative. Populations beyond the existing ROW and access areas will not be affected.

***Diervilla rivularis* Riverbank bush honeysuckle** and ***Sedum nevii* Nevius' stonecrop**
The proposed actions may cause temporary and local impacts to these species. Habitat for both riverbank bush honeysuckle and Nevius' stonecrop are not abundant in the proposed alternative route and include river bluffs, shaded cliffs and rock outcrops. Small local disturbances will not cause significant impacts to populations occurring throughout Alternative 3. Populations beyond the existing ROW, laydown areas and access areas will not be affected.

***Fothergilla major* Large witchalder**
The proposed actions may cause temporary and local impacts to the large witchalder. Small local disturbances will not cause significant impacts to populations occurring throughout the proposed alternative. Populations beyond the existing ROW and access areas will not be affected.

***Isotria medeoloide*s Small whorled pogonia**
Small whorled pogonia is not known from Polk County but is found in an adjacent county in Georgia. According to the USFWS Recovery Plan for *Isoetes medeoloides,* this species is not restricted to uncommon or unique forest habitat types. It has been found in areas described as upland sites in mixed-deciduous or mixed-deciduous/coniferous forests that are generally in second- or third- growth successional stages. Soils are described as highly acidic with moderately high soil moisture levels. In its southern range, common canopy species include chestnut oak, red maple, tulip poplar, white oak and white pine (USFWS 1992). Understory trees and shrubs in the southern part of the range include flowering dogwood, mountain laurel, sourwood, witch-hazel and, in the mountains, flame azalea

(USFWS 1992). Typical ground layer species found throughout its range include Indian cucumber root, lowbush blueberry, New York fern, partridge berry, and rattlesnake plantain with cat-brier, Christmas fern and Virginia creeper primarily being found in its southern range (USFWS 1992). Based on the lack of documented records of this species in Polk County, it is unlikely for small whorled pogonia to occur within the proposed project area. Formal consultation with the USFWS is not required. Informal consultation was conducted on August 16, 2006. The USFWS concurs with this finding.

***Lysimachia fraseri* Fraser's loosestrife**
The proposed actions may cause temporary and local impacts to this species. Small local disturbances will not cause significant impacts to populations occurring throughout the proposed alternative. Populations beyond the existing ROW and access areas will not be affected.

***Monotropsis odorata* Sweet pinesap**
The proposed actions may cause temporary and local impacts to sweet pinesap. Small local disturbances will not cause significant impacts to populations occurring throughout the proposed alternative. Populations beyond the existing ROW and access areas will not be affected.

***Penstemon smallii* Small's beardtongue**
The proposed actions may cause temporary and local impacts to this species. Small local disturbances will not cause significant impacts to populations occurring throughout the proposed project area. Populations beyond the existing ROW and access areas will not be affected.

***Pycnanthemum beadlei* Beadle's mountain mint**
The proposed actions may cause temporary and local impacts to this species. Small local disturbances will not cause significant impacts to populations occurring throughout the proposed project area. Populations beyond the existing ROW and access areas will not be affected.

***Thaspium pinnatifidum* Cutleaved meadow parsnip**
The proposed actions may cause temporary and local impacts to the cutleaved meadow parsnip. Small local disturbances will not cause significant impacts to populations occurring throughout the proposed project area. Populations beyond the existing ROW and access areas will not be affected.

***Thermopsis mollis var. fraxinifolia* Ashleaf goldenbanner**
The proposed actions may cause temporary and local impacts to this species. Small local disturbances will not cause significant impacts to populations occurring throughout the proposed project area. Populations beyond the existing ROW and access areas will not be affected.

Alternative 4 – Build Ocoee 2-Ocoee 3 Transmission Line Using New Right-of-Way South of the Ocoee River (Action)

***Haliaeetus leucocephalus* Bald eagle**
An active bald eagle nest is known to exist approximately 2.2 miles from the existing Ocoee #2 – Ocoee #3 transmission line. The distance is beyond the protective zones designated

by the United State Fish and Wildlife Service (USFWS) to protect bald eagles. Impacts to this nest are not expected from ground-work within the ROW. However, equipment and materials may be transported to some segments of this transmission line by helicopter. Aerial fly-overs necessary to support construction activities along the corridor have the potential to impact this nest. Helicopters or other low-level aircraft are restricted from an area 0.5 miles around the nest within January 1-June 31 under USFWS guidelines. TVA will fully comply with these restrictions in order to prevent impacts to bald eagles. With this commitment, the proposed actions are not likely to adversely affect bald eagles or their nest. Formal consultation with the USFWS is not required. Informal consultation was conducted on August 16, 2006. The USFWS concurs with the restriction.

***Speyeria diana* Diana fritillary**
The proposed actions may cause temporary and local impacts to Diana fritillary habitat in areas where access roads will be upgraded and along the proposed ROW route. A possible result is the temporary loss and disruption of habitat needed by violets; the major food-plant of Diana fritillaries. Violet populations beyond these areas will not be affected and thus Diana fritillary food plants will not be lost from the area. The proposed project area includes abundant Diana fritillary habitat which will not be affected by the proposed actions. The proposed actions are not likely to adversely affect Diana fritillaries.

***Corynorhinus rafinesquii* Rafinesque's big-eared bat**
No caves, mines, or old buildings providing suitable conditions for Rafinesque's big-eared bat are known to occur within the project site. Although Rafinesque's big-eared bats are not known from the area, potential summer roosts in the form of hollow trees and trees with exfoliating bark may exist along or near the proposed ROW. If bats are present, individuals may be flushed from their roosts. This would result in a movement from the designated ROW, but mortality is not likely. Since forested habitat is abundant within Polk County, the loss of forest within the proposed ROW will be insignificant. The implementation of Alternative 4 is not likely to adversely affect big-eared bats or their habitat.

***Myotis leibii* Eastern small-footed bat**
No caves, mines, or old buildings with suitable conditions for eastern small-footed bat are known to occur within the project site. Although Eastern small-footed bats are not known from the area, potential summer roosts in the form of rock outcrops, cliffs, rock faults and crevices may exist along or near the proposed ROW. None of these habitat types were found along the proposed ROW during field investigations, but they may have been overlooked. If bats are present, individuals may be flushed from their roosts. This would result in a movement from the designated ROW, but mortality is not likely. Since forested habitat is abundant within Polk County, the loss of forest within the proposed ROW will be insignificant. The implementation of Alternative 4 is not likely to adversely affect eastern small-footed bats or their habitat.

***Myotis sodalis* Indiana bat**
Indiana bats are not known from Polk County but have been found in adjacent counties. Excellent habitat for Indiana bats occurs nearby, just south of Deep Gap. TVA biologists conducted field studies during May 26 – June 2, 1998 to determine if Indiana bats were present in the area during the maternity season. No Indiana bats were captured during mist net surveys. Although this study could not exclude the presence of Indiana bats from the site, it was determined that this area does not support significant populations of Indiana bats. No suitable hibernacula (caves, mines, old buildings) are known to occur within or near the project site. Indiana bat habitat was assessed using a protocol based on

information in Romme et al. (1995). Forested sections along the proposed transmission line route were ranked as having low quality. Potentially good Indiana bat habitat occurs in hardwood communities that exist within ravines along the proposed ROW. The proposed ROW would span these ravines thus avoiding the clearing of potential Indiana bat habitat in these locations. Given the abundance of forested habitat in the vicinity and the overall low quality ranking of the habitat, the proposed project is not likely to result in adverse impacts to Indiana bats. Alternative 4 is not likely to adversely affect the Indiana bat. Formal consultation with the USFWS is not required. Informal consultation was conducted on August 16, 2006. The USFWS concurs with this finding.

***Fumonelix archeri* Ocoee covert**
A loss of forest cover in the proposed ROW will contribute to the drying of the forest floor which would adversely impact snails. Ocoee coverts are not likely to be located on dry ridges but may exist in wet ravines. Ravines will be spanned which would minimize or eliminate impacts to these areas. In cases where large trees will be removed from within ravines, Ocoee coverts may be impacted. These impacts will only affect a small portion of the potential habitat found throughout Polk County. None of the known populations of Ocoee covert will be impacted by the proposed actions. To reduce potential impacts, TVA will follow the RLRMP and Best Management Practices (BMPs) as outlined in Muncy (1999) where the proposed ROW crosses streams and where it crosses the Ocoee River. The proposed actions will not adversely affect Ocoee coverts with the use of BMPs and following the RLRMP.

***Aster georgianus* Georgia aster**
The proposed actions may cause temporary and local impacts to this species. Potential habitat for the Georgia aster is widespread in the Cherokee National Forest and is described as dry, rocky, open woods and roadsides in areas that probably had a previous history of periodic fire. Small local disturbances will not cause significant impacts to populations occurring throughout the proposed alternative. Populations beyond the new and existing ROW, laydown areas and access areas will not be affected.

***Berberis canadensis* American barberry**
The proposed actions may cause temporary and local impacts to this species. Potential habitat for the American barberry is abundant within Alternative 4 and is described as open rocky woods, openings, and streambanks, or areas with mowing or other canopy-clearing activities (such as powerline corridors, railroad/road right-of-ways and riverbanks). Small local disturbances will not cause significant impacts to populations occurring throughout the proposed alternative. Populations beyond the new and existing ROW, laydown areas and access areas will not be affected.

***Botrychium jenmanii* Dixie grapefern**
The proposed actions may cause temporary and local impacts to the dixie grapefern. Potential habitat for this species is widespread in the Cherokee National Forest including hardwoods, pine woods, open grassy places, and disturbed areas. Small local disturbances will not cause significant impacts to populations occurring throughout the proposed alternative. Populations beyond the new and existing ROW, laydown areas and access areas will not be affected.

***Buckleya distichophylla* Piratebush** and ***Tsuga caroliniana* Carolina hemlock**
The proposed actions may cause temporary and local impacts to these species. Habitat for both piratebush and the Carolina hemlock are not abundant in the proposed alternative

route and include open, dry, rocky bluffs. Small local disturbances will not cause significant impacts to populations occurring throughout Alternative 4. Populations beyond the new and existing ROW, laydown areas and access areas will not be affected

***Delphinium exaltatum* Tall larkspur**
The proposed actions may cause temporary and local impacts to this species. Potential habitat for the tall larkspur is widespread in the Cherokee National Forest and includes dry to moist habitats over calcareous or mafic rock, usually in full or partial sun, often on forest edges or within grassy balds. Small local disturbances will not cause significant impacts to populations occurring throughout the proposed alternative. Populations beyond the new and existing ROW, laydown areas and access areas will not be affected.

***Diervilla rivularis* Riverbank bush honeysuckle** and ***Sedum nevii* Nevius' stonecrop**
The proposed actions may cause temporary and local impacts to these species. Habitat for both riverbank bush honeysuckle and Nevius' stonecrop are not abundant in the proposed alternative route and include river bluffs, shaded cliffs and rock outcrops. Small local disturbances will not cause significant impacts to populations occurring throughout Alternative 4. Populations beyond the existing ROW, laydown areas and access areas will not be affected.

***Fothergilla major* Large witchalder**
The proposed actions may cause temporary and local impacts to the large witchalder. Potential habitat for this species is widespread in the Cherokee National Forest including dry woods and balds. Small local disturbances will not cause significant impacts to populations occurring throughout the proposed alternative. Populations beyond the new and existing ROW, laydown areas and access areas will not be affected.

***Isotria medeoloide*s Small whorled pogonia**
Small whorled pogonia is not known from Polk County but is found in an adjacent county in Georgia. According to the USFWS Recovery Plan for *Isoetes medeoloides,* this species is not restricted to uncommon or unique forest habitat types. It has been found in areas described as upland sites in mixed-deciduous or mixed-deciduous/coniferous forests that are generally in second- or third- growth successional stages. Soils are described as highly acidic with moderately high soil moisture levels. In its southern range, common canopy species include chestnut oak, red maple, tulip poplar, white oak and white pine (USFWS 1992). Understory trees and shrubs in the southern part of the range include flowering dogwood, mountain laurel, sourwood, witch-hazel and, in the mountains, flame azalea (USFWS 1992). Typical ground layer species found throughout its range include Indian cucumber root, lowbush blueberry, New York fern, partridge berry, and rattlesnake plantain with cat-brier, Christmas fern and Virginia creeper primarily being found in its southern range (USFWS 1992). Based on the lack of documented records of this species in Polk County, it is unlikely for small whorled pogonia to occur within the proposed project area. Formal consultation with the USFWS is not required. Informal consultation was conducted on August 16, 2006. The USFWS concurs with this finding.

***Lysimachia fraseri* Fraser's loosestrife**
The proposed actions may cause temporary and local impacts to this species. Potential habitat is widespread in the Cherokee National Forest and is described as hardwood forests, forest edges, roadbanks, and thin soils near rock outcrops. Small local disturbances will not cause significant impacts to populations occurring throughout the

proposed alternative. Populations beyond the new and existing ROW, laydown areas and access areas will not be affected.

***Monotropsis odorata* Sweet pinesap**
The proposed actions may cause temporary and local impacts to sweet pinesap. Potential habitat for this species is widespread in the Cherokee National Forest including dry to mesic pine and mixed pine-hardwood woodlands. Small local disturbances will not cause significant impacts to populations occurring throughout the proposed alternative. Populations beyond the new and existing ROW, laydown areas and access areas will not be affected.

***Penstemon smallii* Small's beardtongue**
The proposed actions may cause temporary and local impacts to this species. Habitat for Small's beardtongue is widespread within the proposed alternative. Small local disturbances will not cause significant impacts to populations occurring throughout the proposed project area. Populations beyond the new and existing ROW, laydown areas and access areas will not be affected.

***Pycnanthemum beadlei* Beadle's mountain mint**
The proposed actions may cause temporary and local impacts to this species. Habitat for Beadle's mountain mint is widespread within the proposed alternative. Small local disturbances will not cause significant impacts to populations occurring throughout the proposed project area. Populations beyond the new and existing ROW, laydown areas and access areas will not be affected.

***Thaspium pinnatifidum* Cutleaved meadow parsnip**
The proposed actions may cause temporary and local impacts to the cutleaved meadow parsnip. Habitat is widespread within the proposed alternative. Small local disturbances will not cause significant impacts to populations occurring throughout the proposed project area. Populations beyond the new and existing ROW, laydown areas and access areas will not be affected.

***Thermopsis mollis var. fraxinifolia* Ashleaf goldenbanner**
The proposed actions may cause temporary and local impacts to this species. Habitat for ashleaf goldenbanner is widespread within the proposed alternative. Small local disturbances will not cause significant impacts to populations occurring throughout the proposed project area. Populations beyond the new and existing ROW, laydown areas and access areas will not be affected.

Cumulative Effects

Alternative 1 – Rebuild Ocoee 2-Ocoee 3 Transmission Line in Place

Proposed activities will take place within existing access roads, power line rights-of way, and road and forest edges. These areas experience periodic disturbance as a result of maintenance and forest use. Most plants and animals occurring within these areas have adapted to some level of disturbance and are capable of recovering following a disturbance event. Although planned activities represent a greater level of disturbance than average, general habitat conditions within the proposed Alternative 1 are not expected to change following completion and recovery of the project. Sensitive species potentially present in the area could experience some-short-term impacts, but recovery is expected. Habitats

outside the immediate proposed Alternative 1 would not be impacted resulting in no cumulative effects.

Alternative 2 – Build Ocoee 2-Ocoee 3 Transmission Line Using New Right-of-Way and Portions of Existing Right-of-Way

Implementation of Alternative 2 would result in a reduction of 36 acres of hardwood forest. No cumulative effects are expected because the forest wide acreage of mature hardwood forest is expected to remain stable on the CNF throughout implementation of the RLMRP. Long-term and range-wide cumulative effects from this alternative are limited. Sensitive species potentially present in the area could experience some short-term impacts, but recovery is expected. Habitats outside the immediate proposed project area of Alternative 2 would not be impacted resulting in no cumulative effects.

Alternative 3 – No Action Alternative

Proposed activities will take place within existing access roads, power line right-of ways, and road and forest edges over approximately 10 years. These areas experience periodic disturbance as a result of maintenance and forest use. Most plants and animals occurring within these areas have adapted to some level of disturbance and are capable of recovering following a disturbance event. Although planned activities represent a greater level of disturbance than average, general habitat conditions within the proposed project area are not expected to change following completion and recovery of the project. Sensitive species potentially present in the area could experience some short-term impacts, but recovery is expected. Habitats outside the immediate proposed project area would not be impacted resulting in no cumulative effects.

Alternative 4 – Build Ocoee 2-Ocoee 3 Transmission Line Using New Right-of-Way South of the Ocoee River (Preferred Alternative)

Implementation of Alternative 4 would result in a reduction of 56 acres of hardwood forest. No cumulative effects are expected because the forest wide acreage of mature hardwood forest is expected to remain stable on the CNF throughout implementation of the RLMRP. Long-term and range-wide cumulative effects from this alternative are limited. Sensitive species potentially present in the area could experience some short-term impacts, but recovery is expected. Habitats outside the immediate proposed project area of Alternative 4 would not be impacted resulting in no cumulative effects.

DETERMINATIONS OF EFFECT

Scientific Name	***Determination of Effect-Alternative 1***	***Determination of Effect-Alternative 2***
Haliaeetus leucocephalus	May affect but not likely to adversely affect with restrictions implemented. (pers. comm. Jim Widlak 8/15/06)	May affect but not likely to adversely affect with restrictions implemented. (pers. comm. Jim Widlak 8/15/06)
Plethodon aureolus	May impact individuals, but not likely to cause a trend to federal listing or a loss of viability.	May impact individuals, but not likely to cause a trend to federal listing or a loss of viability.
Plethodon teyahalee	May impact individuals, but not likely to cause a trend to federal	May impact individuals, but not likely to cause a trend to federal

Scientific Name	***Determination of Effect-Alternative 1***	***Determination of Effect-Alternative 2***
	listing or a loss of viability.	listing or a loss of viability.
Speyeria diana	May impact individuals, but not likely to cause a trend to federal listing or a loss of viability.	May impact individuals, but not likely to cause a trend to federal listing or a loss of viability.
Corynorhinus rafinesquii	May impact individuals, but not likely to cause a trend to federal listing or a loss of viability.	May impact individuals, but not likely to cause a trend to federal listing or a loss of viability.
Myotis leibii	May impact individuals, but not likely to cause a trend to federal listing or a loss of viability.	May impact individuals, but not likely to cause a trend to federal listing or a loss of viability.
Myotis sodalis	May affect *Myotis sodalis* but not likely to adversely affect. (pers. comm. Jim Widlak 8/15/06)	May affect *Myotis sodalis* but not likely to adversely affect. (pers. comm. Jim Widlak 8/15/06)
Fumonelix archeri	May impact individuals, but not likely to cause a trend toward federal listing or loss of viability.	May impact individuals, but not likely to cause a trend toward federal listing or loss of viability.
Aster georgianus	May impact individuals, but not likely to cause a trend toward federal listing or loss of viability.	May impact individuals, but not likely to cause a trend toward federal listing or loss of viability.
Berberis canadensis	May impact individuals, but not likely to cause a trend toward federal listing or loss of viability.	May impact individuals, but not likely to cause a trend toward federal listing or loss of viability.
Botrychium jenmanii	May impact individuals, but not likely to cause a trend toward federal listing or loss of viability.	May impact individuals, but not likely to cause a trend toward federal listing or loss of viability.
Buckleya distichophylla	May impact individuals, but not likely to cause a trend toward federal listing or loss of viability.	May impact individuals, but not likely to cause a trend toward federal listing or loss of viability.
Delphinium exaltatum	May impact individuals, but not likely to cause a trend toward federal listing or loss of viability.	May impact individuals, but not likely to cause a trend toward federal listing or loss of viability.
Diervilla rivularis	May impact individuals, but not likely to cause a trend toward federal listing or loss of viability.	May impact individuals, but not likely to cause a trend toward federal listing or loss of viability.
Fothergilla major	May impact individuals, but not likely to cause a trend toward federal listing or loss of viability.	May impact individuals, but not likely to cause a trend toward federal listing or loss of viability.
Isotria medeoloides	May affect *Isotria medeoloides* but not likely to adversely affect. (pers. comm. Jim Widlak 8/15/06)	May affect *Isotria medeoloides* but not likely to adversely affect. (pers. comm. Jim Widlak 8/15/06)
Lysimachia fraseri	May impact individuals, but not likely to cause a trend toward federal listing or loss of viability.	May impact individuals, but not likely to cause a trend toward federal listing or loss of viability.
Monotropsis odorata	May impact individuals, but not likely to cause a trend toward federal listing or loss of viability.	May impact individuals, but not likely to cause a trend toward federal listing or loss of viability.
Penstemon smallii	May impact individuals, but not likely to cause a trend toward federal listing or loss of viability.	May impact individuals, but not likely to cause a trend toward federal listing or loss of viability.
Pycnanthemum beadlei	May impact individuals, but not	May impact individuals, but not

Scientific Name	***Determination of Effect-Alternative 1***	***Determination of Effect-Alternative 2***
	likely to cause a trend toward federal listing or loss of viability	likely to cause a trend toward federal listing or loss of viability
Sedum nevii	May impact individuals, but not likely to cause a trend toward federal listing or loss of viability.	May impact individuals, but not likely to cause a trend toward federal listing or loss of viability.
Thaspium pinnatifidum	May impact individuals, but not likely to cause a trend toward federal listing or loss of viability.	May impact individuals, but not likely to cause a trend toward federal listing or loss of viability.
Thermopsis mollis var. fraxinifolia	May impact individuals, but not likely to cause a trend toward federal listing or loss of viability.	May impact individuals, but not likely to cause a trend toward federal listing or loss of viability.
Tsuga caroliniana	May impact individuals, but not likely to cause a trend toward federal listing or loss of viability.	May impact individuals, but not likely to cause a trend toward federal listing or loss of viability.

Scientific Name	***Determination of Effect-Alternative 3***	***Determination of Effect-Alternative 4***
Haliaeetus leucocephalus	May affect but not likely to adversely affect with restrictions implemented. (pers. comm. Jim Widlak 8/15/06)	May affect but not likely to adversely affect with restrictions implemented. (pers. comm. Jim Widlak 8/15/06)
Plethodon aureolus	May impact individuals, but not likely to cause a trend to federal listing or a loss of viability.	May impact individuals, but not likely to cause a trend to federal listing or a loss of viability.
Plethodon teyahalee	May impact individuals, but not likely to cause a trend to federal listing or a loss of viability.	May impact individuals, but not likely to cause a trend to federal listing or a loss of viability.
Speyeria diana	May impact individuals, but not likely to cause a trend to federal listing or a loss of viability.	May impact individuals, but not likely to cause a trend to federal listing or a loss of viability.
Corynorhinus rafinesquii	May impact individuals, but not likely to cause a trend to federal listing or a loss of viability.	May impact individuals, but not likely to cause a trend to federal listing or a loss of viability.
Myotis leibii	May impact individuals, but not likely to cause a trend to federal listing or a loss of viability.	May impact individuals, but not likely to cause a trend to federal listing or a loss of viability.
Myotis sodalis	May affect *Myotis sodalis* but not likely to adversely affect. (pers. comm. Jim Widlak 8/15/06)	May affect *Myotis sodalis* but not likely to adversely affect. (pers. comm. Jim Widlak 8/15/06)
Fumonelix archeri	May impact individuals, but not likely to cause a trend toward federal listing or loss of viability.	May impact individuals, but not likely to cause a trend toward federal listing or loss of viability.
Aster georgianus	May impact individuals, but not likely to cause a trend toward federal listing or loss of viability.	May impact individuals, but not likely to cause a trend toward federal listing or loss of viability.
Berberis canadensis	May impact individuals, but not likely to cause a trend toward federal listing or loss of viability.	May impact individuals, but not likely to cause a trend toward federal listing or loss of viability.
Botrychium jenmanii	May impact individuals, but not	May impact individuals, but not

Scientific Name	***Determination of Effect-Alternative 3***	***Determination of Effect-Alternative 4***
	likely to cause a trend toward federal listing or loss of viability.	likely to cause a trend toward federal listing or loss of viability.
Buckleya distichophylla	May impact individuals, but not likely to cause a trend toward federal listing or loss of viability.	May impact individuals, but not likely to cause a trend toward federal listing or loss of viability.
Delphinium exaltatum	May impact individuals, but not likely to cause a trend toward federal listing or loss of viability.	May impact individuals, but not likely to cause a trend toward federal listing or loss of viability.
Diervilla rivularis	May impact individuals, but not likely to cause a trend toward federal listing or loss of viability.	May impact individuals, but not likely to cause a trend toward federal listing or loss of viability.
Fothergilla major	May impact individuals, but not likely to cause a trend toward federal listing or loss of viability.	May impact individuals, but not likely to cause a trend toward federal listing or loss of viability.
Isotria medeoloides	May affect *Isotria medeoloides* but not likely to adversely affect. (pers. comm. Jim Widlak 8/15/06)	May affect *Isotria medeoloides* but not likely to adversely affect. (pers. comm. Jim Widlak 8/15/06)
Lysimachia fraseri	May impact individuals, but not likely to cause a trend toward federal listing or loss of viability.	May impact individuals, but not likely to cause a trend toward federal listing or loss of viability.
Monotropsis odorata	May impact individuals, but not likely to cause a trend toward federal listing or loss of viability.	May impact individuals, but not likely to cause a trend toward federal listing or loss of viability.
Penstemon smallii	May impact individuals, but not likely to cause a trend toward federal listing or loss of viability.	May impact individuals, but not likely to cause a trend toward federal listing or loss of viability.
Pycnanthemum beadlei	May impact individuals, but not likely to cause a trend toward federal listing or loss of viability	May impact individuals, but not likely to cause a trend toward federal listing or loss of viability
Sedum nevii	May impact individuals, but not likely to cause a trend toward federal listing or loss of viability.	May impact individuals, but not likely to cause a trend toward federal listing or loss of viability.
Thaspium pinnatifidum	May impact individuals, but not likely to cause a trend toward federal listing or loss of viability.	May impact individuals, but not likely to cause a trend toward federal listing or loss of viability.
Thermopsis mollis var. fraxinifolia	May impact individuals, but not likely to cause a trend toward federal listing or loss of viability.	May impact individuals, but not likely to cause a trend toward federal listing or loss of viability.
Tsuga caroliniana	May impact individuals, but not likely to cause a trend toward federal listing or loss of viability.	May impact individuals, but not likely to cause a trend toward federal listing or loss of viability.

Alternatives 1, 2, 3 and 4 are not likely to adversely affect the *Isotria medeoloides* or *Myotis sodalis.* Alternatives 1, 2, 3 and 4 are not likely to adversely affect *Haliaeetus leucocephalus* with measures to protect the nesting eagles on Parksville Lake. Informal consultation was conducted on August 16, 2006. The U.S. Fish and Wildlife Service concurs with these findings. Formal consultation with the USFWS is not required.

The implementation of the proposed activities may affect individuals of Sensitive species, however, this would not likely lead to a loss in rangewide viability or trend toward federal

listing. No other Threatened, Endangered or Proposed species that occur on the Cherokee National Forest will be affected. Formal consultation with the USFWS is not required.

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Attachment A
CHEROKEE NATIONAL FOREST
Threatened, Endangered and Sensitive Species 2001 List
Revised 3/17/2006 lml

PRC*	Scientific Name	Common Name	Range/Watersh/Co*	CNF Records	Habitat Information	TES	G-Rank
Amphibians							
1a	Desmognathus carolinensis	Carolina Mountain Dusky Salamander	NC & TN; Doe River Valley SW to Pigeon River Valley	Common in Carter, Unicoi, Greene, Cocke, Washington Counties	Seeps, springs, headwater streams, wet rock faces at lower elevations; more terrestrial at higher elevations; v. common in spruce/fir & northern hardwood forests; 900-6600 ft	S	G4
1a	Desmognathus santeetlah	Santeetlah dusky salamander	NC & TN; Unicoi, Great Smoky, &Great Balsam Mtns. Monroe to Cocke Co.	4 records; Monroe Co. & SW Cocke Co.	Mid-high elevation seeps, stream headwaters, rock faces; 640-1805 m, primarily > 3200 ft	S	G3Q
1a	Eurycea junaluska	Junaluska salamander	W NC & SW TN; Sevier Co. & Monroe Co., TN	8 Monroe Co. records Tellico, Bald & North Rivers, Citico & Slickrock Creeks; potentially Hiwassee River drainage; total 17 streams rangewide	Large streams with sand-gravel substrate, large rocks & adjacent riparian forests. Low elevation, 1100-2000 ft.	S	G3Q
6a	Plethodon aureolus	Tellico salamander	Unicoi Mtns & adjacent valleys of TN and NC, between Little TN & Hiwassee Rivers	1 Monroe Co. record; also in Polk Co.	Hardwood and pine-hardwood forest; terrestrial breeder in leaf litter humus/rotting logs	S	G2G3Q
6a	Plethodon teyahalee	Southern Appalachian salamander	TN, NC, SC, GA: W of French Broad in Cocke Co. to Unicoi Mtns in Polk & Monroe Co.	Polk, Monroe, Cocke Cos.	Deciduous, mesic forest; terrestrial breeders (underground); <5000 ft.	S	G2G3Q
1a	Plethodon welleri	Weller's salamander	SW VA to NE TN & NW NC; Johnson, Carter & Unicoi Co.	10 TDEC records; Johnson, Carter, Unicoi Cos. (3 new records submitted)	Spruce-fir, birch-hemlock and other mesic, rocky forests; boulderfields; grassy open areas; terrestrial breeder-moss mats & rotting logs; > 2200 ft.	S	G3
Arachnids							
1a	Microhexura montivaga	Spruce-fir moss spider	Mountains of NC, TN	3 TDEC records; Roan Mtn.; Carter Co.	Moss and liverwort mats on rocks/boulders in mature spruce-fir forest > 5400 ft.	E	G1
Birds							
1a	Falco peregrinus	Peregrine Falcon	US and CAN	2 TDEC records; hacking Big Bald 1987-89, Carter, Greene, Unicoi Cos.	Nests at ledges of vertical rocky cliffs. Feeds in fields, lakeshores, and river mouths.	S	G4
7b	Haliaeetus leucocephalus	Bald eagle	US and CAN	2 TDEC records; active nest at Parksville Lake 2006; hacking S. Holston Lake 1991-94; recent nests Tellico Lake Carter, Johnson, Unicoi, Sullivan, Monroe, Washington, Polk Cos.	Nests in large "supercanopy" trees along lake & river shores. Prefers roosts in conifers & protected areas along open water in winter.	T	G4
1a	Lanius ludovicianus migrans	Migrant loggerhead shrike	ME to MN south, from GA to AR; OK, TX; CAN: PE to MB	0 TDEC records; occurs thruout E. Tennessee; Greene Co. near Forest	Low elevation crop & grasslands and old fields with scattered trees, shrubs, posts.	S	G5T3Q
Fish							
1a	Cottus baileyi	Black sculpin	SH	4 occ. Laurel Creek; 2 occ. Beaverdam Creek, Doe Creek.	Cool and cold water rivers and streams to headwater springs. Rare in Streams over 15m wide. Utilize riffles,runs, and pools with gravel, stone, and boulder substrates. Mod. To high gradient.	S	G4Q
1a	Cyprinella caerulea	Blue shiner	C	2 occ. Conasauga & Jack's Rivers	Large streams, small to medium-sized rivers, moderate gradient, low elevation	T	G2
1a	Erimonax monachus	Spotfin chub	LT,FB,SH	0 occ. on CNF; Experimental pop. being introduced into Tellico R.	Large streams, moderate gradient, low elevation	T	G2
1a	Etheostoma scotticeps	Sharphead darter	N	1 occ. Nolichucky R.	Large creeks to medium rivers, moderate gradient, cool warm water	S	G2G3
1a	Etheostoma brevirostrum	Holiday Darter	C	2 occ. Conasauga & Jack's Rivers	Large streams to medium rivers, moderate gradient, low elevation	S	G2

Attachment A
CHEROKEE NATIONAL FOREST
Threatened, Endangered and Sensitive Species 2001 List
Revised 3/17/2006 lml

PRC*	Scientific Name	Common Name	Range/Watersh/Co*	CNF Records	Habitat Information	TES	G-Rank
1a	Etheostoma percnurum	Duskytail darter	LT	1 occ. Citico Creek; Experimental pop. being introduced into Tellico R.	Large creeks & small-med rivers 10-80 m wide; moderate gradient, warm	E	G1
1a	Etheostoma vulneratum	Wounded darter	LT, FB (extirpated)	1 occ. Citico Creek	Small to large rivers, low to moderate gradient, low to moderate elevations	S	G3
1a	Ichthyomyzon greeleyi	Mountain brook lamprey	H,O, LT, FB, N, W	3 occ. Hiwassee R. #4 & #5; Spring Cr.; poss in many other streams	Small streams to small upland rivers, moderate to high gradient	S	G3
1a	Noturus baileyi	Smoky madtom	LT	1 occ. Citico Creek; Experimental pop. being introduced into Tellico R.	Large streams, low gradient, low elevation.	E	G1
1a	Noturus flavipinnis	Yellowfin madtom	LT	1 occ. Citico Creek; Experimental pop. being introduced into Tellico R.	Large streams to large rivers, low gradient, low elevation	T	G1
1a	Percina antesella	Amber darter	C	Conasauga River < 5 miles from Forest Bdy.	Large streams and small rivers, low gradient, low elevation	E	G1
1a	Percina burtoni	Blotchside logperch	H, SH (extirpated)	2 occ. Spring Cr. & Hiwassee R.	Large streams to small rivers, moderate gradient, low elevation	S	G2
1a	Percina jenkinsi	Conasauga logperch	C	1 occ. Conasauga River; possibly in Jack's R.	Medium river, moderate gradient, low elevation	E	G1
1a	Percina macrocephala	Longhead darter	SH, W	Watauga & South Holston R. <5 miles from the Forest Bdy.	Large streams to medium rivers, moderate gradient, low to moderate elevations.	S	G3
1a	Percina palmaris	Bronze darter	C	2 occ. Conasauga & Jack's Rivers	Small to medium rivers, moderate gradient, low elevation.	S	G3
1a	Percina squamata	Olive darter	H, FB, N, W	1 occ. Hiwassee R. #4; poss in French Broad, Nolichucky & Watauga	Small to medium rivers, moderate to high gradient, moderate elevations	S	G2
1a	Percina tanasi	Snail darter	O, H, LT	1 occ. Hiwassee R.; Ocoee River < 5 miles from Forest Bdy. LT habitat destroyed by Tellico Res.	Large streams to medium rivers, low to moderate gradient, low elevation.	T	G2
1a	Phenacobius crassilabrum	Fatlips minnow	P, FB, N, W, SH	1 occ, Nolichucky R.; poss French Broad, Nolichucky, Watauga, & South Holston R.	Large streams to medium rivers, moderate to high gradient, moderate elevation	S	G3
2a	Phoxinus tennesseensis	Tennessee dace	O, H, LT, N, W, SH; Ridge & Valley of upper TN system in VA in TN	28 occ. O=8; H=15; LT=3; SH=1; poss Nolichucky & Watauga trib.	1st order spring-fed streams (1-2 m wide) of R&V region & mountain fringes; low to moderate gradients, low to moderate elevation	S	G2G3
Insects and Millipedes							
2a	Cheumatopsyche helma	Helma's net-spinning caddisfly	PA, KY, TN, AL	1 occ. Big Lost Cr (Hiwassee)	Large streams, low gradient, low elevation	S	G1G3
2a	Dixioria fowleri	A millipede	VA, TN, Laurel Fork drainage in Virginia	1 occ., Holston Mtn near Backbone Rock	Leaf litter, deciduous forests	S	G2
2a	Gomphus consanguis	Cherokee clubtail	VA to AL	0 TDEC records; known from Polk and Sullivan Counties	Small, spring-fed streams, mod to high gradient	S	G2G3
2a	Gomphus viridifrons	Green-faced clubtail	Ontario to AL	1 TWRA record; Chestua, Nolichucky R. 2001	Small-large rivers, moderate gradient	S	G3
2a	Macromia margarita	Mountain river cruiser	VA to GA	0 records	Small streams to large rivers, rocky with silt deposits	S	G2G3
2a	Megaleuctra williamsae	William's giant stonefly	VA, TN, NC, SC	0 TDEC records; known from Mt. Rogers & GSMNP	Springs and seeps at high elevations (>4000 feet).	S	G2
2a	Ophiogomphus alleghaniensis	Allegheny Snaketail	WV, VA, TN, AL	0 TDEC records; known from Polk Co. & GSMNP	Spring-fed Piedmont streams	S	G3Q
2a	Ophiogomphus edmundo	Edmund's snaketail	TN, NC, GA	1 occ. Conasauga R.	Large streams, low gradient, low elevation	S	G1
2a	Ophiogomphus incurvatus	Appalachian snaketail	PA, TN, NC, GA	Conasauga River < 5 miles from CNF	Small streams, low gradient	S	G3
4a	Speyeria diana	Diana fritillary	WV to AL	3 TDEC records (Carter & Monroe Co); also in Greene, Cocke, Johnson, Sullivan, Unicoi Cos. (7 new records submitted)	Mature mesic forests, edges & grassy openings; caterpillar host is Viola sp.	S	G3

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Mammals							
4a	Corynorhinus rafinesquii	Rafinesque's big-eared bat	OH to MO, south to FL and LA; OK, TX	1 record; Cocke Co.	Caves & mine portals; summer roosts in hollow trees, under loose bark, & abandoned buildings; forages primarily in mature forest	S	G3G4
1a	Glaucomys sabrinus coloratus	Carolina northern flying squirrel	Mountains of NC, TN, VA	4 TDEC records; Monroe and Carter Cos.	Mature spruce fir and adjacent northern hardwood/hemlock forests above 4000 feet; abundant snags & woody debris, fungi	E	G5T1
1a	Microtus chrotorrhinus carolinensis	Southern rock vole	Mountains of MD, NC, TN, VA, WV	0 TDEC records; likely Monroe, Carter, Unicoi Cos.	Cool, damp coniferous and mixed forest; moist/mossy talus and logs at higher elevations	S	G4T3
1a	Myotis grisescens	Gray bat	VA to KS south, from TN to OK; SC to FL, AL	4 TDEC records; Cocke, Greene, Sullivan Cos.	Uses caves year round; forages along riparian areas/shorelines with forest cover	E	G3
4a	Myotis leibii	Eastern small-footed bat	ME to OH south, from SC to AL, AR, MO, OK; CAN: ON, QC	8 TDEC records; Monroe, Cocke, Greene, Carter Cos.	Bridges, cliffs, mine portals, buildings, summer roosts buildings, hollow trees, loose bark	S	G3
4a	Myotis sodalis	Indiana bat	VT to MI south, to SC, AL; IA to AR, OK	1 TDEC record; Monroe Co; addtl. ANABAT records Monroe Co.	Hibernates limestone caves; maternity roosts primarily hollow trees or trees with loose bark; forages riparian areas and upland water holes	E	G2
1a	Sorex palustris punctulatus	Southern water shrew	Mountains of MD, NC, PA, TN, VA, WV	4 TDEC records Monroe Co.	Swift rocky streams in northern & cove hardwoods; often hemlock, mossy rocks, rhododendron; riparian dependent	S	G5T3
Mussels							
1a	Alasmidonta raveneliana	Appalachian elktoe	N	1 occ. Nolichucky R.	Small to medium rivers, moderate gradient, moderate elevation	E	G1
1a	Epioblasma florentina walkeri	Tan riffleshell	H	2 occ Hiwassee R. #4 & #5	Small to large rivers, low gradient, low elevation	E	G1T1
1a	Epioblasma metastriata	Upland combshell	C	0 occ Critical Habitat	Large streams to medium rivers, low to moderate gradient, low elevation	E	GH
1a	Epioblasma otbcalogenus	Southern acornshell	C	0 occ Critical Habitat	Large streams to medium rivers, low to moderate gradient, low elevation	E	GHQ
1a	Fusconaia barnesiana	Tennessee pigtoe	H, LT, N, FB, W, SH	2 occ Hiwassee R. #4 & #5; LT habitat is inundated by Tellico Res.	Small to medium rivers, moderate to high gradient, low elevation	S	G2G3
1a	Lampsilis altilis	Finelined pocketbook	C	1 occ. Conasauga R. last obs 1999	Large streams to medium rivers, low to moderate gradient, low elevation	T	G2
1a	Lasmigona holstonia	Tennessee Heelsplitter	H, FB	Hiwassee and French Broad trbs. < 5 miles from the Forest Bdy.	Small streams to small rivers, low to moderate gradient, low elevation	S	G3
1a	Lasmigona subviridis	Green floater	W	Watauga R. <5 miles from the Forest Bdy (only location in TN).	Large streams to small rivers, low gradient, low elevation	S	G3
1a	Lexingtonia dolabelloides	Slabside pearlymussel	H	2 occ Hiwassee R. #4 & #5	Small streams to large rivers, moderate to high gradient, low elevation	S(C)	G2
1a	Medionidus acutissimus	Alabama moccasinshell	C	0 occ Critical Habitat	Large streams, low gradient, low elevation	T	G1
1a	Medionidus parvulus	Coosa moccasinshell	C	0 occ Critical Habitat	Large streams, low gradient, low elevation	E	G1
1a	Pleurobema decisum	Southern clubshell	C	0 occ Critical Habitat	Large streams to medium rivers, low to moderate gradient, low elevation	E	G1G2
1a	Pleurobema georgianum	Southern pigtoe mussel	C	1 occ. Conasauga R.	Medium rivers, moderate gradient, low elevation	E	G1
1a	Pleurobema hanleyianum	Georgia pigtoe	C	Conasauga River < 5 miles from Forest Bdy.	Small streams to large rivers, moderate to high gradient, low elevation	S(C)	GHQ
1a	Pleurobema oviforme	Tennessee clubshell	H	2 occ Hiwassee R. #4 & #5	Large streams, low gradient, low elevation	S	G3
1a	Pleurobema perovatum	Ovate clubshell	C	0 occ Critical Habitat	Large streams, low gradient, low elevation	E	G1

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1a	Pryobranchus greenii	Triangular kidneyshell	C	O occ Critical Habitat	Large streams, low gradient, low elevation	E	G1
1a	Strophitus connasaugaensis	Alabama creekmussel	C	1 occ. Conasauga R.	Large streams, low gradient, low elevation	S	G3
1a	Villosa nebulosa	Alabama rainbow	C	1 occ. Conasauga R.	Large streams, low gradient, low elevation	S	G3
1a	Villosa trabalis	Cumberland bean pearly mussel	H	2 occ Hiwassee R. #4 & #5	Large streams and small rivers, low gradient, low elevation	E	G1G2
1a	Villosa vanuxemensis	Coosa creekshell	C	1 occ. Conasauga R.	Small and large streams, low gradient, low elevation	S	G4T2
Reptiles							
1a	Clemmys muhlenbergii	Bog turtle	Local: SH; US: MA south to GA, TN	South Holston R. tribs with bogs; < 5 miles from Forest, Johnson Co.	Slow, shallow, mucky rivulets of sphagnum bogs, seeps, wet cow pastures, & shrub swamps	S	G3
Snails							
4a	Fumonelix archeri	Ocoee covert	Restricted to Polk Co	Polk Co.	Leaf litter under rock ledges and ravines.	S	G1
1a	Pallifera hemphilli	Black mantleslug	MI, NC, TN, VA	0 TDEC records; Field Museum records Polk (2), Carter (4) Cos.	Spruce fir and mesic forests with moist litter, downed wood and rock cover; high elevation	S	G3
1a	Paravitrea placentula	Glossy supercoil	VA, TN, NC, KY Off-forest Cocke Co.; unk location Sullivan Co.	0 TDEC records; Field Museum & CNF records Polk(2), Monroe(2), Carter(2), Unico(1) Cos.	Leaf litter of deciduous forests and streamside forests with moist litter, downed wood & rock cover.	S	G3
1a	Ventridens coelaxis	Bidentate dome	NC, TN, KY, VA Off-CNF & unk locations Carter, Johnson, Sullivan Cos.	Field Museum & Forest records, Carter (5) and Johnson (3) Cos.	Mesic deciduous forest, mid-high elevation	S	G3
1a	Vertigo bollesiana	Delicate vertigo	ME south to TN, NC	2 records Monroe Co.; 1 Field Museum record Johnson County	Rich coves, acidic coves, other deciduous forests with downed wood	S	G3
1a	Vertigo clappi	Cupped vertigo	KY, TN, VA, WV	5 records Monroe Co.	leaf litter and debris on steep wooded slopes with boulders and rotting timber	S	G1G2
Non-vascular Plants							
1a	Acrobolbus calistus	A liverwort	Mountains of NC, TN, SC, GA. AK, Japan, Taiwan, and India. Monroe Co.	1 Record	On rock in moist ravines, spray cliffs, cascading streams, and spruce/fir forests; Riparian dependent except when in the spruce/fir forest zone.	S	G3?
2a	Aneura maxima (=A. sharpii)	A liverwort	Mountains of VT, south to NC and TN	0 Records	Humus or gravelly soil at base of wet outcrops, along streams, and waterfalls. Mostly riparian dependent	S	G1G2
2a	Aspiromitus appalachianus	A hornwort	TN, NC, SC	Undocumented records have been reported.	On rock in streams. Riparian dependent	S	G1
2a	Bartramidula wilsonii	Dwarf apple moss	Macon & Jackson Counties, NC and Monroe County, TN	0 Records. Known from Monroe County however site is undocumented.	Wet, acidic rock in the rain, especially road cuts. Also on spray cliffs and in humid gorges. Mostly riparian dependent.	S	G3?
1a	Barzania nudicaulis	A liverwort	Mountains of VA, TN, and NC	2 locations; Roan Mountain	On rock and bark of *Abies fraseri*, *Picea rubens*, *Betula lutea*, *Prunus pennsylvanica*, and *Sorbus americana* in spruce/fir forests.	S	G2G3
1a	Brachydontium trichodes	Peak moss	Europe, Mount Rainier, NH, NC, and TN	Unknown # on Roan Mountain	Moist, shady, acidic rock, especially sandstone; rocky seepage along mountain trails	S	G2
1a	Bunbaumia minakatae	Hump-backed Elves	Nova Scotia, MA, NY, MI, VT, VA, NC and Japan	0 Records	Swampy areas; habitats occupied by *Nowellia*, *Lophocolea*, and *Tetraphis*; rotten logs or stumps; found on elm, ash and yellow birch logs.	S	G2G3
2a	Cephalozia macrostachya ssp australis	A liverwort	NC to MS	0 Records	On soil in rock crevices along streams. Riparian dependent.	S	G4T1
1a	Cephaloziella massalongi	A liverwort	Europe, VT, TN, and NC	0 Records	Rock crevices and soil above 5,500'. Often with copper or sulphur deposits.	S	G2G3

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2a	Cheiloleyeunea evansii	A liverwort	NC, SC, AL, and TN. Monroe Co.	1 Record	On tree bark in humid gorges. Variety of mesic to dry-mesic hardwoods including *Quercus* spp., *Liriodendron tulipifera*, *Nyssa sylvatica*, *Carya* spp., *Liquidambar styraciflua*, *Fraxinus* spp., and *Ilex opaca*. The moss *Fissidens subbasilaris* is nearly a constant associate.	S	G1
1a	Chiloscyphus appalachianus	A liverwort	KY, NC, SC, and TN. Monroe Co.	1 Record	On wet rock, usually near cascades or waterfalls. Riparian dependent.	S	G1G2
1a	Diplophyllum apiculatum var. taxifolioides	A liverwort	NC, TN The variety *taxifolioides* is known from several locations in NC and from Mt. Leconte in TN.	0 Records.	On moist soil or rocks at moderate to high elevations. *Diplophyllum* collected below 3,000 feet is likely to be *D. apiculatum* (Hicks 1992). The variety is thought to be a hybrid of *D. apiculatum* and *D. taxifolioides* (Shuster 1974).	S	G5T1Q
1a	Diplophyllum obtusatum	A liverwort	Newfoundland, MN, mountains of NC & TN	0 Records.	In crevices of rock outcrops in spruce/fir forests; >5,500 ft. Always associated with damp, shaded rocks. It is also known to occur within mixed mesophytic forest in NC (Shuster 1974).	S	G2?
2a	Ditrichum ambiguum	A moss	CA, MT, NC, NH, NY, OR, VT, WA; BC, QC, SK	0 Records.	On bare soil of moist banks of roads or streams in wooded, upland, or montane habitats. Also acidic coves.	S	G3?
2a	Drepanolejeunea appalachiana	A liverwort	Mountains of VA, TN, NC, SC, and GA; PR	4 Records.	On rock and the bark of trees and shrubs along streams, mixed mesophytic forest, and in humid gorges. Most often found on *Kalmia*, *Rhododendron*, *Clethra*, and *Ilex*. Substrates for the CNF pops include rock, *Quercus alba*, and *Betula alleghaniensis*.	S	G2?
2a	Entodon concinnus	Lime entodon	NC, TN; AB, BC, NS	0 Records.	On moist calcareous rock.	S	G4G5
2a	Fissidens appalachensis	Appalachian pocket moss	NC and TN. Monroe Co.	1 Record.	In rock crevices submerged in swift running, shallow water. Riparian dependent.	S	G2G3
1a	Frullania appalachiana	A liverwort	Mountains of TN, NC, GA, and SC	0 Records.	Usually on the bark of hardwoods (*Acer spicatum*, *Betula alleghaniensis*, *Sorbus americana*) above 3,500 ft. in spruce/fir zone. Also known from mesic forests and escarpment gorges on the bark of *Castanea dentata* and *Liriodendron tulipifera*.	S	G1?
1a	Frullania oakesiana	A liverwort	Northern Europe, Japan, and Mountains of VT to NC and TN	0 Records.	Tree bark in spruce/fir forests.	S	G3?
1a	Gymnoderma lineare	Rock gnome lichen	TN, NC, SC, GA	1 Record, Roan Mountain	High elevation rocky summits and rock outcrops.	E	G2
2a	Homaliadelphus sharpii	Sharp's homaliadelphus	Japan, Vietnam, Mex; MO, VA, NC, and TN	0 Records.	Vertical surfaces and ledges of calcareous cliffs and boulders. Dry mafic or calcareous rocks in gorges.	S	G3
2a	Hydrothyria venosa	An aquatic lichen	CA to MT and Canada; Appalachians from Canada to TN & NC. Monroe Co.	1 Record	On rock substrates in clear, cold mountain streams. Riparian dependent.	S	G3
2a	Lejeunea blomquistii	A liverwort	Mountains of NC, TN, and GA. Monroe Co.	2 Records.	Rock and bark in humid gorges, and dead trees or vertical rock faces of spray cliffs.	S	G1G2
1a	Lejeunea dimorphophylla	A liverwort	The Caribbean; coastal plain of FL and NC	~~1 possible Record, Monroe County~~. This has proven to be *Lejeunea ulicina* ssp. *bullata*.	On bark of trees in the outer coastal plain. Riparian dependent.	S	G2G3
1a	Leptodontium excelsum	Grandfather Mountain leptodontium	VA, TN, NC, and GA	Unknown # on Roan Mountain	Bark of trees in high elevation, spruce/fir forests.	S	G2
2a	Leptolyreunium sharpii	Mount Leconte moss	TN, NC, and SC	0 Records.	On shaded, moist or wet rock (often cliffs and waterfalls) and within hemlock/hardwood cove forests. Elevation ranged from 1900- 5400'.	S	G1

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1a	Lophocolea appalachiana	A liverwort		see Chiloscyphus appalachianus	See Chiloscyphus appalachianus	S	G1G2?
2a	Marsupella emarginata var. latiloba	A liverwort	Range unknown	0 Records.	Moist rocks in humid gorges, waterfall spray zones, wet rock & seeps along streams, or humid microclimates at high elevation. Riparian dependent.	S	G5T1T2
2a	Megaceros aenigmaticus	A hornwort	NC, TN, and GA. Monroe and Cocke Co's.	25+ Records (often abundant in areas where found)	Shaded rocks in small streams and springs, or spray cliffs. Riparian dependent.	S	G2G3
1a	Metzgeria fruticulosa (= M. temperata)	A Liverwort	Asia, Europe; PNW US; VA, NC, and TN	1 Record, Roan Mountain	Rock and bark of trees from spruce/fir zone to hemlock/hardwood forests above 3000'.	S	G2Q
2a	Metzgeria furcata var. setigera	A liverwort	NC and SC, possibly TN	0 Records.	In humid gorges or on damp, shaded rocks in spruce/fir forests.	S	G4T1
2a	Metzgeria uncigera	A liverwort	PR; SE coast to mountains of NC	0 Records.	On *Rhododendron* bark in mountains.	S	G3
2a	Nardia lescurii	A liverwort	VA, WV, KY, TN, NC, SC, and GA. Monroe Co.	3 Records	Low elevations in mountains, on peaty soil over rock near shaded streams. Riparian dependent.	S	G3?
2a	Pellia appalachiana	A liverwort	MN, NC, SC, TN, and GA. Monroe and Polk Co's.	3 Records.	Permanently damp or wet sites and moist outcrops, usually near waterfalls. Mostly riparian dependent	S	G1?
2a	Plagiochila austinii	A liverwort	NH and VT to NC and TN	0 Records.	On shaded, moist rock outcrops in the mountains.	S	G3
2a	Plagiochila caduciloba	A liverwort	Mountains of TN, NC, SC, and GA. Monroe Co. (Historic record from Greene County)	2 Records.	Damp, shaded rock faces, usually along streams in mountain gorges and on spray cliffs; 1000-4900 ft. Riparian dependent.	S	G2
2a	Plagiochila echinata	A liverwort	Mountains of TN, NC, and SC. Monroe and Polk Co's.	4 Records.	Damp, shaded rock faces and crevices in mountain gorges, above cascades and near waterfalls. Riparian dependent.	S	G2
2a	Plagiochila sharpii	Sharp's leafy liverwort	TN, NC, SC, and GA	0 Records.	Shaded, moist rocks in humid gorges. Riparian dependent.	S	G2G3
1a	Plagiochila sullivantii var spinigera	A liverwort	Mountains of VA, WV, NC, SC, and TN. Monroe Co.	1 Record.	Moist, shaded rock outcrops, under cliff ledges, and in rock crevices; spray cliffs and spruce/fir forests; > 2500 ft.	S	G2T1
1a	Plagiochila sullivantii var sullivantii	Sullivant's leafy liverwort	Mountains of VA, WV, KY, TN, NC, SC, and GA. Monroe Co.	1 Record.	Moist, shaded rock outcrops, cliff ledges and rock crevices; spray cliffs and spruce/fir forests; > 2500 ft.	S	G2T2
2a	Plagiochila virginica var carolinana	A liverwort	VA, NC, SC, and TN	2 Records, no varietal info.	On moist rock near waterfalls; humid gorges, and rocky banks of shaded streams. Riparian dependent. Generally at lower elevations.	S	G3T2
2a	Plagiochila virginica var virginica	A liverwort	WV, to NC, SC, TN, GA, and MS	2 Records, no varietal info.	On shaded rock along streams and moist rock faces, especially limestone. Riparian dependent. Generally at lower elevations.	S	G3T3
2a	Plagiomnium carolinianum	Carolina plagiomnium	TN, NC, SC, and GA	0 Records.	Moist, granitic or humus covered rock, especially on cliff ledges near streams or waterfalls; rocks or streambanks in humid gorges. Riparian dependent.	S	G3
2a	Platyhypnidium pringlei	A moss	Mexico, AZ; NC, SC, and suspected in TN	0 Records.	Attached to acidic rock in running water, permanent seeps, or spray cliffs of waterfalls in hemlock/hardwood forests. Riparian dependent.	S	G2
1a	Polytrichum appalachianum	Appalachian haircap moss	TN and NC	0 Records.	High elevation rocky summits, rock outcrops, and shrub balds.	S	G3
2a	Porella wataugensis	Watauga porella	KY, TN, NC, and SC. Monroe Co.	2 Records	Rock faces in humid gorges & wet rock near small streams above inundation. Riparian dependent.	S	G2
2a	Radula sullivantii	A liverwort	Mountains of NC, SC, TN, and GA	0 Records.	Shaded rock outcrops near streams and waterfalls in mountain gorges. Riparian dependent.	S	G2

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1a	Radula voluta	A liverwort	Europe, South America; mountains of NC and TN. Monroe Co.	1 Record	Shady rock faces in spray areas around waterfalls. Riparian dependent.	S	G3
1a	Riccardia jugata	A liverwort	Mountains of NC and TN. Monroe and Polk Co's.	3 Records.	On moist wood and humus in mesic areas and humid gorges.	S	G1G2
1a	Sphenolobopsis pearsonii	A liverwort	Europe, Africa, Asia, Atlantic and Pacific Islands, Pacific NW; NC and TN	Roan Mountain (Undocumented)	On rock and bark of *Abies fraseri*, *Picea rubens*, *Prunus pensylvanica*, and *Sorbus americana* in spruce/fir forests.	S	G2
1a	Sticta limbata	A foliose lichen	Canada to CA; mountains of NC and TN	0 Records.	Bark of hardwoods in high elevation northern hardwood forests	S	G3G4
1a	Taxiphyllum alternans	Japanese yew-moss	Asia; MD to FL, NC, and LA	0 Records.	Soil, humus, or bark in wet, swampy areas; on limestone in the spray area of waterfalls. Riparian dependent.	S	G3?
1a	Tortula ammonsiana	Ammons' tortula	Africa; WV, NC, and TN	0 Records.	Cliff overhangs and crevices with seepage in rich hardwood forests. Riparian dependent.	S	G2?
Vascular Plants							
1a	Aconitum reclinatum	Trailing white monkshood	South and central mountains of NC, PA, TN, VA, WV. Carter Co.	1 Record.	Rich forest habitats on seepage slopes, boulderfields, streambanks, and coves at high elevations, associated with mafic rock.	S	G3
4a	Aster georgianus	Georgia aster	AL, FL, GA, NC. Suspected in SE TN	0 Records	Dry, rocky, open woods and roadsides in areas with a history of frequent fire. Likely associated with historic post or blackjack oak woodlands.	S	G2G3
4a	Berberis canadensis	American barberry	PA to IL, south to AL, GA; IL, MO. Monroe, Johnson, Sullivan, Washington, Carter, and several ridge and valley counties.	0 Records	Open rocky woods, openings, and streambanks, usually over mafic or calcareous rock; occurring in thin soil. Historic habitats were fire maintained.	S	G3
4a	Botrychium jenmanii	Dixie grapefern	MD to FL; TN, AL, MS, LA. Monroe, Hamblen, Putnam Co's.	0 Records	Dry to moist forests; open, grassy areas; and disturbed areas.	S	G3G4
4a	Buckleya distichophylla	Piratebush	Mountains of NC, TN, VA. Carter, Cocke, Greene, Sullivan, Unicoi, Washington Co's.	14 Records.	Open, dry, rocky woods and bluffs, typically calcareous-shaley soils; Known sites occur between 1900-3300 ft.	S	G2
1a	Calamagrostis cainii	Cain's reed grass	Mountains of NC, TN. Sevier Co.	0 Records	High elevation rocky summits and disturbed areas 4000-6000 ft.	S	G1
1a	Cardamine clematitis	Small mountain bittercress	Mountains of AL, NC, SC, TN, VA. Carter, Johnson, Unicoi, Washington, Monroe, Sevier Cos.	13 Records	Wet, rocky areas; springs, seeps, and streambanks; moss or moist soil; > 3,500'; Mostly riparian dependent.	S	G2G3
1a	Carex misera	Wretched sedge	Mountains of GA, NC, TN. Blount, Sevier, Carter, Unicoi	4 Records	Medium to high elevation cliffs, balds and rocky areas.	S	G3
1a	Carex roanensis	Roan sedge	GA, KY, NC, TN, VA. Carter, Johnson, Unicoi, Cocke, Sullivan	25 Records	Mesic forests; often associated with birch and beech at high elevations.	S	G1
1a	Cimicifuga rubifolia	Appalachian bugbane	AL, IL, IN, KY, TN. Monroe, Sullivan, & several Ridge and Valley cos.; Primary Cumberland Plateau in TN.	0 Records	River bluffs, ravines, and rich cove forests over talus and rocky calcareous soils; typically north facing slopes; 800-1500 ft.	S	G3
1a	Collinsonia verticillata	Stoneroot	MD to GA; OH, KY, TN. Monroe, McMinn, Blount, Sevier, Johnson, and several counties to west.	0 Records	Rich forests in moist coves to dry oak forests over mafic or calcareous rock.	S	G3
1a	Coreopsis latifolia	Broadleaf tickseed	Mountains of GA, NC, SC, TN. Polk, Carter, Greene	6 Records	Rich, moist cove and slope forests 1,500 to 4,500 ft. Flowering triggered by canopy gaps.	S	G3
1a	Danthonia epilis	Bog oat-grass	GA, NC, NJ, SC, TN. Cocke	0 Records	Seeps around rock outcrops in the mountains. Riparian dependent.	S	G3?

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PRC*	Scientific Name	Common Name	Range/Watersh/Co*	CNF Records	Habitat Information	TES	G-Rank
4a	Delphinium exaltatum	Tall larkspur	OH, PA south to TN, NC; AL, MO, ME. Mostly Ridge and Valley Co's, but reported from Cocke Co.; Known from the Blue Ridge in NC.	0 Records;	Dry to moist habitats over mafic rock, usually in full or partial sun (grassy balds or forest edges). Also rich woods (and edges of woods), rocky slopes, semi-open woodlands, glades and prairie openings.	S	G3
4a	Diervilla rivularis	Riverbank bush-honeysuckle	Mountains of AL, GA, NC, TN. Unicoi, Washington, Polk, and some Ridge and Valley Co's.	12 Records	Bluffs, rock outcrops, and riverbanks	S	G3
4a	Fothergilla major	Large witchalder	AL, AR, GA, NC, SC, TN. Polk, Sevier, Greene, and some west of Blue Ridge	3 Records	Dry ridge top and bluff forests of moderate elevations.	S	G3
1a	Gentiana austromontana	Appalachian gentian	Mountains of NC, TN, VA, WV. Carter, Greene, Johnson, Sullivan, Unicoi, Washington Cos.	70 Records	High elevations in open forests, grassy balds, and along roads and trails.	S	G3
1a	Geum geniculatum	Bent avens	Mountains of NC, TN. Carter Co.	5 Records	High elevation peaks, seeps, wet boulderfield forests, grassy balds, cliff bases, and stream banks.	S	G2
1a	Geum radiatum	Spreading avens	Mountains of NC, TN. Sevier, Blount, Carter.	3 Records	Thin soil on rocky summits, cliffs, & ledges; open, grassy balds near *Rhododendron catawbiense*; >4200'	E	G1
1a	Glyceria nubigena	Great Smoky Mountain mannagrass	Mountains of NC, TN. Sevier.	0 Records	Moist to soggy ground at higher elevations, especially seepage areas on heath balds and high ridges and mucky places in spruce-fir forests	S	G2
1a	Hedyotis purpurea var. montana	Roan Mountain bluet	Mountains of NC, TN. Carter	1 Record	Habitat includes crevices in rock outcrops and gravelly soils at the edges of grassy balds.	E	G5T2Q
1a	Helianthus glaucophyllus	Whiteleaf sunflower	AL, NC, SC, TN. Carter, Greene, Johnson, Unicoi Cos.	12 Records	Mesic forests and woodlands at medium elevations. Flowering associated with increased light	S	G3
1a	Heuchera longiflora var. acerodes	Maple-leaf alumroot	Range for H. longiflora is AL, KY, NC, OH, TN, VA, WV. No published range info for variety. Cocke, Greene Cos.	9 Records	Moist ravines and rich cove forests, especially over mafic or calcareous rock.	S	G4T2Q
1a	Hymenophyllum tayloriae	Taylor's filmy fern	NC, SC, TN, GA. Sevier, Fentress, Overton.	0 Records	Humid gorges, moist ceilings of rock grottoes and spray cliffs. Riparian dependent.	S	G1G2
1a	Hypericum graveolens	Mountain St. Johnswort	Mountains of NC, TN. Sevier, Unicoi, Carter, Johnson.	3 Records	High elevation grassy balds and forest openings.	S	G3
1a	Hypericum mitchellianum	Blue Ridge St. Johnswort	Mountains of NC, TN, VA, WV. Unicoi, Carter, Cocke, Greene, Johnson, Sevier, Blount, Monroe.	12 Records	Grassy balds, seeps, and forest openings.	S	G3
1a	Ilex collina	Longstalked holly	NC, VA, WV. Suspected in TN	0 Records	Wetlands, seeps, or streambanks >2,000 ft often in association with *Tsuga canadensis, Betula lenta, Ilex montana, Picea rubens*, and *Rhododendron maximum*. Also moist, rocky slopes in northern hardwood or mixed spruce/hardwood forests.	S	G3
4a	Isotria medeoloides	Small whorled pogonia	ME to GA; Midwestern US and CAN. Washington, Hamilton.	0 Records	Open deciduous, or mixed pine-deciduous forests, often on dry to moist leaf litter.	T	G2G3
1a	Juglans cinerea	Butternut	Central and eastern US and southeastern CAN. All Blue Ridge counties and scattered throughout TN.	11 Records	Moist, rich forests especially along rivers in bottomlands and floodplains.	S	G3G4
1a	Lilium grayi	Gray's lily	Mountains of NC, TN, VA. Carter and Johnson Co's.	8 Records	Bogs, seeps, grassy balds, moist forest edges, and wet meadows at medium to high elevations.	S	G3

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4a	Lysimachia fraseri	Fraser's yellow loosestrife	Regional endemic of AL, GA, NC, SC, TN, KY, IL. Polk, Sevier, Cocke, Hamilton, and a few counties in west TN.	10 Records	Forest edges, road banks, Along streams and rivers, and thin soil near rock outcrops. Locally abundant in the Ocoee River Gorge. Dependent upon cyclical natural disturbances to maintain open conditions.	S	G2
1a	Minuartia godfreyi	Godfrey's stitchwort	Regional endemic AL, AR, FL, NC, SC, TN. Carter, Johnson.	3 Records	Wet ditches, meadows, seeps, streams banks, and springs; associated with calcareous soils. Riparian dependent.	S	G1
4a	Monotropsis odorata	Sweet pinesap	DE to FL, AL, KY, TN, WV. Centered in Appalachians. Polk, Monroe, Blount, Sevier, Cocke, Greene, and a few counties west.	8 Records	Dry to mesic pine and mixed pine/hardwood forests.	S	G3
4a	Penstemon smallii	Small's beardtongue	Mountains of AL, GA, NC, SC, TN. Polk, Cocke, Greene, Washington, Unicoi, Carter, and several counties west.	0 Records	Woodlands, cliffs, glades, and roadsides.	S	G3
1a	Pityopsis ruthii	Ruth's golden aster	Southeast TN	12 Records; Polk Co.	Crevices in phyllite & graywacke boulders in historical flood zone Ocoee & Hiwassee Rivers.	E	G1
1a	Platanthera integrilabia	White fringeless orchid	VA to GA, KY to AL, MS. Polk, Monroe and several Cumberland Plateau counties	2 Records	Forested wetlands with open or semi-open canopy. Wet, flat, boggy areas at the head of streams or seepage slopes. Often found in association with *Sphagnum* and *Osmunda cinnamomea*, *Woodwardia areolata*, and *Thelypteris novaboracensis*, in acidic muck or sand, and in partially, but not fully shaded areas.	S	G2G3
1a	Potamogeton tennesseensis	Tennessee pondweed	OH, PA, TN, VA, WV. Polk, Monroe, Blount and counties west.	1 Record	Slow moving streams and rivers. Riparian dependent.	S	G2
1a	Prenanthes roanensis	Roan Mountain rattlesnake root	Mountains of NC, TN, VA. Polk, Sevier, Greene, Unicoi, Carter, Johnson.	48 Records	High elevation rich woods, grassy balds, and forest openings.	S	G3
4a	Pycnanthemum beadlei	Beadle's mountain mint	Mountains of southwest VA to GA, TN. Carter	0 Records	Forests and woodland borders.	S	G2G4
1a	Rosa obtusa cula	Appalachian Valley rose	TN endemic. Only known collection from Cocke Co.	0 Records; not tracked by TDEC; NY Botanical Garden Database lists one record (1897) in Cocke County near French Broad River between Paint Rock and Del Rio.	Listed by TN Natural Heritage (1999) as a rare endemic, known from wooded slopes and riverbanks. Taken off after Rare Plant Advisory Committee meeting (1999) until taxonomic issues are resolved. It could be *Rosa palustris*. At this point it is considered to be "State Historic".	S	G1G3Q
1a	Rugelia nudicaulis	Rugel's Indian plantain	Mountains of NC, TN. Cocke, Sevier, Blount	0 Records	Spruce/fir and northern hardwood forest openings.	S	G3
1a	Saxifraga caroliniana	Carolina saxifrage	Mountains of GA, NC, TN, VA, WV. Carter, Cocke, Johnson Cos.	4 Records	Moist rock outcrops and cliffs; wet soil at the base of rocks; cool, shaded, rocky woods. Almost always in steep terrain and often in areas misted by spray from nearby waterfalls or in areas where water trickles down the rocky slopes.	S	G2
1a	Scutellaria arguta	Hairy skullcap	GA, KY, NC, TN, VA. Unicoi	0 Records	High to mid elevation forests and moist talus slopes	S	G2?Q
1a	Scutellaria saxatilis	Rock skullcap	CT to IN, south to AL, GA, SC, AR. Polk, Blount, Unicoi, Carter, Johnson, Cocke, Greene	43 Records	Rocky, dry to mesic forests and open areas	S	G3
4a	Sedum nevii	Nevius' stonecrop	AL, GA, TN. Polk	9 Records all restricted to the Ocoee River Gorge	Shaded, rocky bluffs and cliffs	S	G3
1a	Sida hermaphrodita	Virginia fanpetals	KY, MD, OH, PA, TN, VA, IN, MI, Ontario. Cocke, Washington, Claiborne	0 Records	Sandy or rocky riverbanks	S	G2

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1a	Silene ovata	Blue Ridge catchfly	AL, AR, GA, IL, IN, KY, MS, NC, SC, TN, VA. Polk, Sevier, Cocke, Greene, Unicoi and west.	4 Records	Mid elevations over mafic or calcareous soils. Rich cove and oak/hickory forests.	S	G2G3
1a	Solidago spithamaea	Blue Ridge goldenrod	Mountains of NC, TN. Carter Co, Roan Mtn.	1 Record	Rocky places (outcrops, ledges, cliffs, balds) above 4500 ft.	T	G1
1a	Spiraea virginiana	Virginia spiraea	AL, GA, KY, LA, NC, OH, PA, TN, VA, WV	1 Record, no longer extant; Unicoi Co., Nolichucky River	Riverbanks and riverside shrub thickets; rocky areas susceptible to flood scour. Riparian dependent.	T	G2
1a	Stachys clingmanii	Clingman's hedge-nettle	AL, IN, MD, NC, SC, TN, WV. Monroe, Sevier, Blount, Cocke, Unicoi	7 Records	Rich boulderfields, cove, northern hardwood, and spruce/fir forests, and clearings at high elevations.	S	G2Q
4a	Thaspium pinnatifidum	Cutleaved meadow parsnip	AL, GA, KY, NC, OH, TN, VA. Greene, Cocke, Hamilton	1 Record	Forests and woodlands over calcareous rock	S	G3?
4a	Thermopsis mollis var. fraxinifolia	Ashleaf goldenbanner	Mountains of GA, NC, SC, TN; AL. Polk, Monroe, Blount, Greene	28 Records	Openings and ridges in dry woodlands. Often on road banks.	S	G4? T3?
1a	Trillium rugelii	Southern nodding trillium	Mtns & Piedmont of AL, GA, NC, SC, TN. Carter, Cocke, Unicoi, Washington, Polk, Blount, Sevier	6 Records	Rich forests and coves often over mafic or calcareous substrates.	S	G3
1a	Trillium simile	Sweet white trillium	Mountains of GA, NC, SC, TN. Polk, Monroe, Sevier, Blount, Cocke	Several Records, not in database.	Rich soils of slopes or coves over mafic or calcareous rock.	S	G3
4a	Tsuga caroliniana	Carolina hemlock	Mountains of GA, NC, SC, TN, VA. Carter, Johnson, Sullivan, Unicoi, Washington	51 Records	Ridge tops, rocky bluffs and open forests. Generally dry conditions.	S	G3

*PRC = Project Review Code; to get the appropriate code for each species use the Project Review Code Key (Attachment B).
* Co. = Counties from which the species is currently known. Does not represent potential occurrence. Counties of occurrence for vascular plants obtained from University of TN Plant Atlas, online version, 4/04.
Range abbreviations refer to the major watersheds on the Cherokee NF: Conasauga, Ocoee, Hiwassee, Little Tennessee, Pigeon, French Broad, Nolichucky, Watauga, and South Holton.
Forest Occurrence Data is based upon currently known records. It is NOT necessarily reflective of potential occurrence, especially for plants.
Habitat Information is only a summary. For a more thorough discussion on species, refer to the individual species write-ups that have been provided.
For streams the following definitions apply:

Orders	Gradients	Elevations
small 3, 4	low <=2%	low<=1200'
medium 5, 6, 7	moderate>2% - <=4%	high>1200'
large 8, 9	high>4%	

Attachment B
Process for complying with FSM 2600 Supplement R8-2600-2002-2
Key for determining the Project Review Code (PRC) for each TES Species

Last changed 10/29/04 mvc

	T&E Species	Sensitive Species
1. Does the species have potential to occur in the area affected by the project, based on range and habitat information?		
a. No, project is located out of species known range or suitable habitat does not exist in the project area.	No affect	No impact
b. Yes, project is within species known range and suitable habitat may exist within the project area.	2	
2. Is the project expected to have no effects regardless of the number and location of individuals in the area affected by the project?		
a. Yes, all requisite habitat has been identified and excluded from disturbance associated with the project.	No affect	No Impact
b. No or unsure of effects.	3	
3. Is the project expected to have totally beneficial effects regardless of the number and location of individuals in the area affected by the project?		
a. Yes, the project is being implemented for the for the benefit of this species.	May affect, not likely to adversely affect	Beneficial affect
b. No or unsure of effects.	4	
4. Would information on number and location of individuals improve design and/or application of mitigation to reduce adverse effects, or allow better assessment of effects to viability of the population?		
a. No, assume species is present	Make the appropriate Determination of Effect and document the reasoning	
b. Yes, or unsure.	5	
5. Is the species already covered by a current site specific inventory for the project area?		
a. No, or unsure.	6	
b. Yes, additional site specific inventory is not necessary; use existing inventory information.	7	
6. Are inventory methods feasible and effective for providing substantial information on number and location of individuals?		
a. No (i.e. requires DNA analysis for identification to species level).	May affect, not likely to adversely affect	May impact individuals, but not likely to cause a trend to federal listing or a loss of viability
b. Yes, site-specific inventory is needed; conduct inventory.	7	
7. An adequate inventory was conducted.		
a. Species was not found; document.	No affect	No impact
b. Species found; analyze affects.	Make the appropriate Determination of Effect and document the reasoning	