

APPENDIX B

BIOLOGICAL EVALUATION
Greasy Creek Vegetation Management
Compartments 301, 302, 303, 304, 305, 306, 307, 308, 309, 311, 312, 357, 375
USDA FOREST SERVICE, SOUTHERN REGION
CHEROKEE NATIONAL FOREST
OCOEE RANGER DISTRICT

INTRODUCTION

The purpose of this biological evaluation (BE) is to document any potential effects of the project on threatened, endangered, or sensitive (TES) species or their habitat, and to ensure land management decisions are made with the benefit of such knowledge. The objectives of this evaluation are to:

- 1) Ensure Forest Service 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.

PROPOSED ACTION AND ALTERNATIVES

The Ocoee Ranger District of the Cherokee National Forest proposes vegetation management, prescribed burning, wildlife opening maintenance, herbicide use, ephemeral pool creation, and road construction and reconstruction. Each alternative is described below.

Alternative B Proposed Action

Silvicultural Treatments – *Proposed Activities*

1) Restore natural oak and oak-pine communities through silvicultural treatments on approximately 83 acres of existing forested stands that have been altered from desired conditions due to previous land use. Restore these stands to forested communities that would naturally occur on these sites. These are mostly upland sites that would support “dry to mesic oak forest” or “dry and dry mesic oak-pine forests”. Regeneration sources would be existing seedlings, coppice or stump sprouts, and supplemental planting of oaks. Herbicide application (triclopyr) would be applied in these stands the second year after planting.

2) Restore shortleaf pine and shortleaf pine-oak communities through silvicultural treatments on approximately 307 acres of existing forested stands that have been altered from desired conditions due to previous land use. These are mostly ridge sites that would support “xeric pine and pine-oak forests” within which fire has historically played an important role in shaping species composition. Site preparation and a second year chemical release using herbicide (triclopyr) would ensure the survival and establishment of desired oak and pine.

3) Restore native pine-oak communities that have been impacted by southern pine beetle mortality. This upland pine-oak stand would be prescribe burned for site preparation and allowed to regenerate naturally from seeding and sprouting on 39 acres.

Additional Wildlife Habitat Improvements – Proposed Activities

- 1) Chemical methods would be used to establish desired vegetation on approximately 10.5 miles of TVA transmission line. This is total mileage of line; the actual area treated with herbicide would generally be much less than the total acreage. About 8 miles of the line is outside of the original Greasy Creek Ecosystem Assessment Area.
- 2) Maintain approximately 46 acres of existing spot and linear wildlife openings. Maintenance activities typically include, but are not limited to, mowing, fertilizing, sowing, day-lighting, burning and rehabilitation.
- 3) Seed areas of timber harvest that are site prep burned with a non invasive grass seed mixture immediately following burn.
- 4) Install ephemeral pools in temporary roads and gated roads in appropriate areas (approximately 10-30 pools up to 0.25 acre each).

Fuel Reduction – Proposed Activities

Prescribe burn the following units totaling 4,250 acres: O32 Seed Orchard, O30 Presswood Mountain, O36 Madden Branch, O34 Coon Creek (Hooper Mountain).

Transportation System – Proposed Activities

- 1) Relocate and construct 1.2 miles of National Forest System Road (NFSR) 185 for the purpose of moving the road out of riparian habitat and improving water quality in Clear Creek. The old road bed would be obliterated and returned to riparian habitat.
- 2) Reconstruct 3.9 miles of existing NFSRs to bring them up to standards. Work would consist of widening curves, spot placing gravel, brushing, minor re-shaping, cleaning and constructing dips and other drainage structures to improve overall drainage, upgrading culverts, and replacing gates.
- 3) Perform prehaul maintenance on approximately 17.9 miles of NFSRs to prepare the roads for management activities. Prehaul maintenance activities include placing gravel and grading.
- 4) Construct 1.9 miles of temporary roads to access harvest units. Temporary roads would be closed and stabilized following completion of the project.

Mitigation common to action alternative:

FW-3, FW-6, FW-7 FW-9, and FW-10: Filter strips would be used between ground disturbance and streams.

FW-14, FW-15, and FW-16: Herbicides would be used during timber stand improvement and site preparation activities following these standards.

FW-28 Protect individuals and locations of federally listed threatened and endangered species, and individuals and locations of other species needed to maintain their viability within the

planning area. Site specific analysis of proposed management actions will identify any protective measures.

FW-34: The following points apply to roost tree retention for Indiana bat:

GENERAL. For Indiana bat, snags with exfoliating bark are not intentionally felled unless needed to provide for immediate safety of the public, employees, or contractors. Exceptions may be made for small-scale projects such as insect and disease control, salvage harvesting, and facility construction.

FOREST REGENERATION TREATMENTS > 10 ACRES. When implementing regeneration treatments in hardwood-dominated forest types, a minimum average basal area of 15 square feet per acre is retained throughout the rotation. In some portion of the treatment area, residual basal area should be clumped or left in travel corridors. All snags and all shagbark hickory over 6 inches DBH are retained except those that are immediate hazards. If additional trees are needed to meet the basal area requirements, priority should be given to hollow/den trees or trees that exhibit, or are likely to develop, characteristics favored by roosting Indiana bats. Snags do not count toward the leave basal area. Borders of clearcut units will be irregularly shaped.

FOREST REGENERATION TREATMENTS < 10 ACRES. No residual retention basal area (live trees) is required. All snags will be retained unless they are immediate hazards. Shagbark hickory greater than 6 inches DBH is retained.

FW-35: During all silvicultural treatments in hardwood forest types, retention priority is given to the largest available trees that exhibit characteristics favored by roosting Indiana bats.

FW-36: To avoid injury to non-volant young Indiana bats, prescribed burning of potential maternity roosting habitat between May 1 and August 15 is prohibited except where site-specific inventories coordinated with USFWS indicate Indiana bats are not likely to be present, unless otherwise determined by project-level consultation with USFWS.

FW-40: Known black bear den sites will be protected for as long as they remain suitable by prohibiting vegetation management and ground-disturbing activities within a minimum 100 feet around the den.

FW-41: Potential black bear den trees will be retained during all vegetation management treatments. Potential den trees are those that are greater than 20" DBH and are hollow with broken tops.

FW-44: Protection zones are delineated and maintained around all bald eagle nest and communal roost sites, until they are determined to be no longer suitable through coordination with USFWS. The protection zone extends a minimum of 1500 feet from the nest or roost. Activities that modify the forest canopy within this zone are prohibited. All management activities not associated with bald eagle management and monitoring are prohibited within this zone during periods of use (nesting season is October 1 to June 15; roost use periods are determined through site-specific monitoring). Where controlled by the FS, public access routes into or through this zone are closed during the seasons of use

FW-53: Retain soft mast-producing species (dogwood, black gum, hawthorn, grapes, serviceberry, etc.) during vegetation cutting treatments to the extent possible, within constraints of meeting treatment objectives.

FW-60: Forests dominated by Eastern hemlock will not be subject to regeneration harvest. Hemlock will be retained as patches (a minimum of 0.25 acres) during all silvicultural treatments.

FW-67: When seeding temporary openings such as temporary roads, skid trails, and log landings, use only native or non-persistent nonnative species.

FW-97: Dormant season burns have a cutoff date of May 1st or the break of dormancy, as recommended by multi-disciplinary review and TWRA with decision by line officer.

Riparian Prescription Standards-RX11-1, RX11-8, RX11-29, RX11-30, RX11-31, and RX11-32: Vegetation Management within defined riparian corridors will emphasize maintenance of large trees for woody debris recruitment as the desired condition.

Additional Bald Eagle Mitigation

If burning takes place during bald eagle nesting season (October 1 through June 15 or when monitoring determines eagles are nesting) prescribed burning will be conducted with the following mitigation:

- There will be no aerial ignition within the secondary zone. While the remainder of the burn may be conducted by aircraft, the flight path will not be within the secondary zone.
- Prior to and during ignition, the wind direction will be away from the nest location.
- The wind direction will be monitored during ignition.
- The eagles will be monitored during ignition to record their behavior.
- If the wind direction shifts towards the nest, burning will be completed in as timely a manner as possible observing all human safety precautions.
- No activities that modify the canopy would occur during nesting season (October 1 to June 15) within secondary zone.

AFFECTED AREA

The project area encompasses approximately 12,910 acres within the Ocoee River watershed. The area varies widely in topography, from sloping hills and flatter areas around the streams to steeper slopes on ridges in the area. Elevations are from around 800 feet to 2,700 feet ASL. Dry upland sites occupied by yellow pine, upland hardwood, and mixed stands are characteristic of the overall area; cove sites are also present and include yellow poplar, white pine, white oak and hemlock as predominant overstory species. Common shrub zone species including mountain laurel, blueberry, huckleberry, and greenbriar are present. Common herbaceous species include galax, poison ivy, ferns, trillium, and smilax. There are currently 277 acres (3%) within the 0-10 year age class (base year 2008) of the total forested acres including 76 ac existing 0-10 and 201 ac (2.5%) planned for southern pine beetle restoration.

Perennial water sources are readily accessible from all parts of the compartments. Openland, grassy wildlife openings within the compartments include approximately 46 acres of linear and spot openings.

The Greasy Creek project can be found on the Benton, Caney Creek, Ducktown, McFarland, Oswald Dome, and Parksville quadrangle maps north of Ocoee River. No special habitat features including caves, talus, boulders, spray cliffs and waterfalls, or seeps and springs have been located in the activity areas.

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 TES Database Maps (both State Natural Heritage and Cherokee's GIS) were examined to locate any records of TES species present in the project area.

Snail, salamander, and butterfly surveys were completed in 2007. Botanical surveys were completed from May 2006 through September 2007. Botanical resources in relation to burning were also assessed by Pistrang (2005). Bat surveys were completed in August 2007. Forest-wide surveys used for this analysis include bat surveys (Cochran et al. 1999, Cochran et al. 2000, Copperhead Environmental Consulting 2007, Sewell et al. 2006, Harvey et al. 1991, Kiser and Kiser 1999, Leftwich et al. 2007, Libby 2004, Libby 2005, 3-D International 1998), small mammal surveys (Harvey et al. 1991), snail surveys (Brian Cole unpublished data, Cherokee National Forest snail survey database, Copperhead Environmental Consulting 2007, Gumbert et al. 2006, Leftwich et al. 2007), and bird surveys (Bartlett and Buehler 1994, Buehler and Bartlett 1995, Buehler and Klaus 1996, Buehler and Klaus 1997, Buehler and Klaus 1998, R8 Bird, and ongoing surveys).

Species known from the area are *Haliaeetus leucocephalus*, *Speyeria diana*, *Phoxinus tennesseensis*, *Diervilla rivularis*, *Lysimachia fraseri*, *Sedum nevii*, and *Trillium rugelii*. The fish are protected by riparian standards and the plants are not within any anticipated impact site, thus there would be no effects to them. They are not further evaluated here. *Cheumatopsyche helma*, *Gomphus consanguis*, *Gomphus viridifrons*, *Macromia margarita*, *Ophiogomphus alleghaniensis*, and *Ophiogomphus incurvatus* are possible in or near the project area. The aquatic species would be protected by the riparian mitigation and thus there would be no effects to them. They are not further evaluated here.

Some species were not found during surveys but habitat is available within the burn areas. They were given a review code of 4a and analyzed.

Attachment A is the Project Review Form for BE's. Each species was evaluated and given a Project Review Code (PRC) on the Form based on the Project Review Code List (Attachment B).

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	
<i>Haliaeetus leucocephalus</i>	bald eagle
Insects	
<i>Speyeria diana</i>	Diana fritillary
Mammals	
<i>Corynorhinus rafinesquii</i>	Rafinesque's big-eared bat
<i>Myotis leibii</i>	Eastern small-footed bat
<i>Myotis sodalis</i>	Indiana bat
Snails	
<i>Paravitrea placentula</i>	Glossy supercoil
<i>Patera archeri</i>	Ocoee covert
<i>Vertigo bollesiana</i>	Delicate vertigo
<i>Vertigo clappi</i>	Cupped vertigo
Non-vascular Plants	
<i>Ditrichum ambiguum</i>	A moss
<i>Homaliadelphus sharpii</i>	A moss
Vascular Plants	
<i>Aster georgianus</i>	Georgia aster
<i>Berberis canadensis</i>	American barberry
<i>Botrychium jenmanii</i>	dixie grapefern
<i>Buckleya distichophylla</i>	piratebush
<i>Delphinium exaltatum</i>	tall larkspur
<i>Diervilla rivularis</i>	riverbank bush-honeysuckle
<i>Fothergilla major</i>	large witchalder
<i>Gentiana austrorontana</i>	Appalachian gentian
<i>Isotria medeoloides</i>	small whorled pogonia
<i>Lysimachia fraseri</i>	Fraser's yellow loosestrife
<i>Monotropsis odorata</i>	sweet Pinesap
<i>Penstemon smallii</i>	Small's beardtongue
<i>Pycnanthemum beadlei</i>	Beadle's mountain mint
<i>Sedum nevii</i>	Nevius' stonecrop
<i>Thaspium pinnatifidum</i>	cutleaved meadow parsnip
<i>Thermopsis mollis var. fraxinifolia</i>	ashleaf goldenbanner
<i>Trillium rugelii</i>	Southern nodding trillium
<i>Tsuga caroliniana</i>	Carolina hemlock

HABITAT RELATIONSHIPS

This section of the BE describes relationships between species and their habitats. Species do not occur at random, but are related to specific habitat types.

***Haliaeetus leucocephalus* Bald eagle**

Breeding habitat for this species most commonly includes areas close to coastal areas, bays, rivers, lakes, or other bodies of water that reflect the general availability of primary food sources including fish, waterfowl, and seabirds. Bald eagles preferentially roost in conifers or other sheltered sites in winter; they typically select the larger, more accessible trees. Winter roost sites vary in their proximity to food resources and may be determined to some extent by a preference for a warmer microclimate at these sites. In Saskatchewan lakes, density was positively correlated with abundance of large fishes. In winter, eagles may associate with waterfowl concentrations or congregate in areas with abundant dead fish. Wintering areas are commonly associated with open water though in some areas eagles use habitats with little or no open water if other food resources (e.g. rabbit or deer carrion) are readily available. Bald eagles usually nest in tall trees or on cliffs near water. Nest trees include pines, spruce, firs, cottonwoods, oaks, poplars, and beech. Ground nesting has been reported on the Aleutian Islands in Alaska, in Canada's Northwest Territories, and in Ohio, Michigan, and Texas. The same nest may be used year after year, or may alternate between two nest sites in successive years.

In 2006 and 2007, there was one active bald eagle nest on Parksville Lake. The tree the nest was in since has died. It is unknown at the time of this writing, if eagles will nest in the same vicinity. The Greasy Creek project area borders Parksville Lake to the north.

***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 2001). 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. The adult's food consists of dung and flower nectar from plants including common and swamp milkweeds, ironweed, red clover, and butterflybush (Butterflies and Moths of North America <http://www.butterfliesandmoths.org/> accessed 2006).

***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 occurs in caves or similar sites; small caves are selected, and the bats stay near the entrance (often within 30 m) and are thought to move about in winter. Winter habitat in the south is poorly 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 2001).

***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. Several bachelor colonies and two maternity colonies have been observed in bridges, mines and rock crevices during the period 2000-2003 (G. Libby, Personal communication). 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. 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. During this autumn period, bats roost under sloughing bark and in cracks of dead, partially-dead and live trees.

***Paravitrea placentula* glossy supercoil**

The range of this species is Tennessee, North Carolina, Virginia, and Kentucky. Its habitat is under leaf litter on wooded hillsides and ravines (NatureServe 2005).

***Patera archeri* Ocoee covert**

This snail has been found in Polk County in leaf litter under rock ledges in ravines (NatureServe 2005).

***Vertigo bollesiana* delicate vertigo**

This species is found in leaf litter on wooded hillsides and marshes (Hubricht 1985). The range of delicate vertigo is scattered from Maine west to Minnesota, and south to Tennessee and North Carolina (NatureServe 2004). Two records of delicate vertigo on the CNF occur in Monroe County and one record in Johnson County.

***Vertigo clappi clappi* cupped vertigo**

This snail is found on steep, often north facing slopes with mixed woodlands, boulders and rock outcrops (Cole unpublished data). Its range includes Kentucky, Tennessee, Virginia, and West Virginia (NatureServe 2005). There are 5 known occurrences on the Cherokee in Monroe County.

***Ditrichum ambiguum* a moss**

Ditrichum ambiguum is a moss species that is known from scattered locations in eastern North America, through Canada to California and disjunct to India. In the east, the species is known to occur on bare soil of moist banks of roads or streams in wooded, upland, or montane habitats (Crum and Anderson 1981). This plant was not found during botanical surveys of stands

prescribed for vegetation management, however habitat is available in the burn areas and thus it will be analyzed in this document.

***Homaliadelphus sharpii* Sharp's homaliadelphus**

Homaliadelphus sharpii is currently known from only three counties in Tennessee and one county each from Missouri, North Carolina, and Virginia. It is also known from Mexico, Japan, and Vietnam (Crum and Anderson 1981). In Tennessee, the known sites are in the Ridge and Valley physiographic province; however, it is also known to occur in the Blue Ridge Mountains in North Carolina. Habitat is described as vertical surfaces and ledges of calcareous cliffs and boulders. This plant was not found during botanical surveys of stands prescribed for vegetation management, however habitat is available in the burn areas and thus it will be analyzed in this document.

***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 2004). NatureServe (2005) states that there are approximately 60 known extant populations for this species, most of which are small, consisting of stands of only 10-100 stems. "Many populations are vulnerable to accidental destruction from road maintenance activities such as herbicide application, and from road expansion. Other populations are threatened by residential development and/or encroachment of invasive exotic plants. This species has also suffered from fire suppression" (NatureServe 2005). This plant was not found during botanical surveys of stands prescribed for vegetation management, however habitat is available in the burn areas and thus it will be analyzed in this document.

***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 2004). NatureServe (2005) states that "*Berberis canadensis* occurs in open woods, on bluffs and cliffs and along river banks in the eastern and central United States. 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). *Berberis canadensis* is found in 19 mountain counties in southwest Virginia. Occupied habitat includes dry, open woodlands over limestone, dolomite, richer sandstone or shale substrates, rocky and cliffy areas and open areas and glades with naturally thin soil. In Georgia, occupied habitat is described as dry, hard soil on upper, west-facing slopes and dry, rocky woods." (NatureServe 2005). No locations for this plant are currently recorded for the Cherokee National Forest. This plant was not found during botanical surveys of stands prescribed for vegetation management, however habitat is available in the burn areas and thus it will be analyzed in this document.

***Botrychium jenmanii* dixie grapefern**

This plant ranges from Virginia south to Florida through Tennessee, Alabama, and Louisiana. Like most other *Botrychiums*, specific habitat is difficult to categorize, and may include dry to moist forests and disturbed areas. NatureServe (2005) states that this species is moderately widespread across the southeast. 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. This plant was not found during botanical surveys of stands prescribed for vegetation management, however habitat is available in the burn areas and thus it will be analyzed in this document.

***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 northeastern Tennessee (Weakley 2004). 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 2004). This plant was not found during botanical surveys of stands prescribed for vegetation management, however habitat is available in the burn areas and thus it will be analyzed in this document.

***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 2004). NatureServe (2005) states that this species' habitats include rich woods (and edges of woods), rocky slopes, semi-open woodlands, glades and prairie openings. This plant was not found during botanical surveys of stands prescribed for vegetation management, however habitat is available in the burn areas and thus it will be analyzed in this document.

***Diervilla rivularis* riverbank bush-honeysuckle**

Riverbank bush-honeysuckle is a southern Appalachian endemic, currently known to occur in Tennessee, Georgia, Alabama, and North Carolina. This species usually occurs on bluffs, rock outcrops, or riverbanks, from moderate to high elevations. (Weakley 2004), but is also found in our area along the Ocoee River at approximately 1,000' elevation. There are currently 12 known sites for this species on the Cherokee National Forest. This plant was found during previous surveys of the area. None were found during botanical surveys of stands prescribed for vegetation management involving ground disturbance. However, two records exist for areas along roadsides. Habitat is also available in the burn areas and thus it will be analyzed in this document.

***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 2004). There are currently four known occurrences of this species on the Cherokee National Forest. The effects of fire on this species are not known (TN Dept. of Ag. 1994) however, the location of populations, on dry ridgetops, suggest some natural fire effects. The related species, *Fothergilla gardeni*, is adapted to fire maintained communities in the Coastal Plain and Piedmont (Kral 1983). This plant was not found during botanical surveys of stands prescribed for vegetation management, however habitat is available in the burn areas and thus it will be analyzed in this document.

***Gentiana austromontana* Appalachian gentian**

This is a southern Appalachian endemic known from West Virginia and Virginia, south to the mountains of North Carolina and Tennessee. Plants are typically found at high elevations in open forests, or grassy balds (Weakley 2004). There are currently 70 known locations on the Cherokee National Forest, many of which occur along forest roads and trails. This is a species of forest openings and edges and is likely suppressed under a closed canopy. This plant was not found during botanical surveys of stands prescribed for vegetation management, however habitat is available in the burn areas and thus it will be analyzed in this document.

***Isotria medeoloides* small whorled pogonia**

Small whorled pogonia is a federally Threatened species that has an historic range that includes most of the eastern United States, however, it is extremely rare throughout its range. According to NatureServe (2005) this is “a widely distributed species with one hundred four extant sites known, sixty-six centered around the Appalachian Mountains of New England and coastal Massachusetts, eighteen centered around the southern Appalachians, thirteen in the Coastal Plain and Piedmont of Virginia, Delaware, and New Jersey, and seven widely scattered outlying sites, including one in Ontario, Canada which was last seen in 1987. Populations are typically very small and the total number of individuals is estimated to be less than 3000.” This plant was not found during botanical surveys of stands prescribed for vegetation management, however habitat is available in the burn areas and thus it will be analyzed in this document.

***Lysimachia fraseri* Fraser’s yellow loosestrife**

This species is a regional endemic, occurring in eastern Tennessee, the Carolinas, Alabama, and Georgia with disjunct populations in southern Illinois and northwestern Tennessee. The species is known from hardwood forests, forest edges, roadbanks, and thin soils near rock outcrops. Flowering seems dependent upon treefall gaps or other openings in the canopy (Weakley 2004), and also from wet areas such as alluvial meadows, moist stream and river banks, flats along streams, moist pastures, and roadside ditches (NatureServe 2007) *Lysimachia fraseri* is largely a disturbance adapted plant, often occurring in areas where a disturbance regime, such as periodic fire or flood, creates and maintains favorable habitat. Flowering seems dependent upon treefall gaps or other openings in the canopy and the greatest threats to populations in general are shading and competition from successional growth (NatureServe 2007). The species is previously known from ten locations on the Forest (F2). This plant was found during previous surveys of the area. None were found during botanical surveys of stands prescribed for vegetation management involving ground disturbance. However, records exist for areas along roadsides and floodplains. Habitat is also available in the burn areas and thus it will be analyzed in this document.

The forest wide viability analysis (Cherokee National Forest 2004c) indicates high to moderate risk levels for this species depending upon the associated habitat. Previously known locations of this species fall under the following mapped prescription allocations: Administrative Sites, Scenic Byway Corridors, and Dispersed Recreation Areas

***Monotropis odorata* sweet pinesap**

Monotropis odorata has a range from Maryland and West Virginia south to Georgia and Alabama, though it seems to be centered in the Appalachians (Weakley 2004). It typically inhabits dry to mesic pine and mixed pine-hardwood woodlands. The species is micotrophic (deriving it's nutrition from another vascular plant via fungal hyphae) thus the distribution of this species may be tied, in part, to the distribution of particular fungi species and other vascular plants. 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 fairly non-specific habitat requirements, it remains an extremely rare plant throughout its range. There are currently ten known sites for this species on the Cherokee National Forest. Effects from fire are generally undescribed in the literature, however this author has observed vigorous colonies of this plant growing in recently burned areas and it is noted that this species grows in habitats in which fire plays a role (TN Dept. of Ag. 1994). This plant was not found during botanical surveys of stands prescribed for vegetation management, however habitat is available in the burn areas and thus it will be analyzed in this document.

***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 2004). There are currently no records of this species on the Cherokee National Forest. This plant was not found during botanical surveys of stands prescribed for vegetation management, however habitat is available in the burn areas and thus it will be analyzed in this document.

***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 south through east Tennessee to southwest North Carolina and northwest South Carolina. There are currently no documented sites for this species on the Cherokee National Forest though there is a report (James T. Donaldson personal communication 2000) that this species occurs in Carter County, Tennessee. This plant was not found during botanical surveys of stands prescribed for vegetation management, however habitat is available in the burn areas and thus it will be analyzed in this document.

***Sedum nevii* Nevius' stonecrop**

This species is endemic to southeastern Tennessee and central Alabama. Its habitat is rocky bluffs and cliffs. In our area, it is known only from the Ocoee River gorge. This plant was found during previous surveys of the area. None were found during botanical surveys of stands prescribed for vegetation management involving ground disturbance. However, records exist for bluffs along roadsides. Habitat is also available in the burn areas and thus it will be analyzed in this document.

***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 2004). There is currently one documented site for this species on the Cherokee National Forest. This plant was not found during botanical surveys of stands prescribed for vegetation management, however habitat is available in the burn areas and thus it will be analyzed in this document.

***Trillium rugelii* Southern nodding trillium**

This species ranges from western North Carolina and eastern Tennessee, south to the central portions of Georgia and Alabama. Habitat includes rich forests and coves, usually underlain with mafic or calcareous rock. (Weakley 2004). This plant was found during previous surveys of the area. None were found during botanical surveys of stands prescribed for vegetation management involving ground disturbance. However, one record exists in association with Parksville Campground within a burn unit.

***Thermopsis mollis* var. *fraxinifolia* ashleaf goldenbanner**

Thermopsis fraxinifolia is a southern Appalachian endemic that is known from North Carolina and Tennessee, south to northern portions of Georgia and South Carolina. Habitat includes forest openings in dry woodlands and along ridges. Many of the locations on the Cherokee National Forest are associated with roads and trails. There are currently 34 known sites for this species on the Cherokee National Forest with several other locations recently reported from the Hogback project area. This plant was not found during previous surveys of the area. However, habitat is available in the burn areas and thus it will be analyzed in this document.

The forest wide viability analysis (Cherokee National Forest 2004c) indicates moderate risk levels for this species. Previously known locations of this species fall under the following mapped prescription allocations: Designated Wilderness; Recommended Wilderness Study Areas; Scenic Areas; Dispersed Recreation Areas; Black Bear Habitat Management; Management, Maintenance, and Restoration of Plant Associations to Their Ecological Potential; and Remote Backcountry Recreation, Few Open Roads

***Tsuga caroliniana* Carolina hemlock**

This southern Appalachian endemic ranges from Virginia, south through Tennessee and North Carolina, to northern portions of Georgia and South Carolina. This tree occurs on ridge tops, rocky bluffs, and open forests, generally on drier, rockier sites than *Tsuga canadensis*, though the two species have been found intermixed in humid gorges (Weakley 2004). This plant was not found during botanical surveys of stands prescribed for vegetation management, however habitat is available in the burn areas and thus it will be analyzed in this document.

EFFECTS

Direct and Indirect Effects

Alternative A: No action

With the no action alternative, the forest would continue to age with natural succession occurring. Trees would die, fall from the canopy and leave more debris and logs on the ground. Canopy gaps would become more common, followed by successional growth of maples, black gum, white pine, and sourwood. In the short-term, this may create grassy habitat utilized by *Speyaria diana*. Plant species that are less shade tolerant may benefit from the canopy gaps.

In areas of the forest in early to mid successional stages, plants that benefit from increased sunlight on the ground may lose vigor as the forest ages and canopies close. These species include *Aster georgianus*, *Berberis canadensis*, *Botrychium jenmanii*, *Delphinium exaltatum*, *Penstemon smallii*, and *Pycnanthemum beadleii*. The decrease in sunlight may benefit other plants, including most of the mosses and liverworts. Other TES species will not be impacted.

Alternative B:

The effects from nine different activities associated with the proposed action will be analyzed for impacts to the above listed species. These are the effects of the ground disturbance created during the timber removal, planting, transmission line maintenance, prescribed burning from August 15-May 1, maintenance of wildlife openings, herbicide use, seeding, creation of ephemeral pools, and road construction and reconstruction.

Haliaeetus leucocephalus

Assuming the eagles nest near the project area, no activities that modify the canopy would occur during nesting season (October 1 to June 15) within the secondary zone. Prescribed burning may occur during this time, however, mitigation outlined in this document would apply. Other Forest Plan standards would also be applied. The proposed activities may affect individuals, but are not likely to cause a trend to federal listing or a loss of viability. The project is consistent with the protective measures set forth in the RLRMP (FW-44).

Speyaria diana

If any butterfly caterpillars are present during ground disturbing activities, those individuals would likely be destroyed. Prescribed burning may increase habitat, especially in the woodland restoration areas, by increasing grassy areas favored by the butterflies. Given this species preference for moist habitats which would be less likely to be impacted and the short-term disturbance, few individuals would be directly negatively affected by the burning. Maintenance of wildlife openings and seeding burned areas would benefit the species by providing grassy openings. Herbicide use in the transmission line to establish a more native community would benefit the butterfly by increasing native plants, especially native plants that are host food to caterpillars. The other proposed actions would not affect the species. The project is not likely to cause a trend to federal listing or a loss of viability.

Corynorhinus rafinesquii* and *Myotis leibii

Suitable roosting and foraging habitat occurs within the affected areas for Rafinesque's big-eared bat and suitable foraging habitat occurs within the affected areas for Eastern small-footed bat. No suitable hibernacula (caves, mines, old buildings) are known to occur within or near the areas. If any bats are in the areas during ground disturbance, individuals utilizing snags may be dislodged. This would result in movement from the area, but mortality is not likely. Indirect

effects would include potential changes in forage availability and snag availability due to canopy removal. However, the RLRMP standards aimed at protecting Indiana bat including provisions for snag retention (FW-34) and prescribed burning (FW-36) would also benefit these species. Herbicide use, planting, and maintenance of wildlife openings would not affect the bats. Creation of ephemeral pools would benefit the bats by providing water sources. Long-term population changes are not expected due to the small impact area and scale of the projects. Suitable habitat would remain around the affected areas. The project is not likely to cause a trend to federal listing or a loss of viability.

Myotis sodalis

Suitable roosting and foraging habitat occurs within the affected areas for Indiana bat. No suitable hibernacula (caves, mines, old buildings) or summer roost sites are known to occur within or near the areas. If any bats are in the areas during ground disturbance, individuals utilizing snags may be dislodged. This would result in movement from the area, but mortality is not likely. Indirect effects would include potential changes in forage availability and snag availability due to canopy removal. However, the RLRMP established standards aimed at protecting Indiana bat including provisions for snag retention (FW-34) and prescribed burning (FW-36). Herbicide use, planting, and maintenance of wildlife openings would not affect the bats. Creation of ephemeral pools would benefit the bats by providing water sources. Long-term population changes are not expected due to the small impact area and scale of the projects. Suitable habitat would remain within and around the affected areas.

The proposed action is consistent with the Cherokee National Forest Revised Land and Resource Management Plan (2004). Alternative B is not likely to adversely affect the *Myotis sodalis*, because the project is consistent with the protective measures for Indiana bat set forth in the RLRMP. The USFWS concurs with this finding (2008).

Snails

Areas of suitable habitat for the Ocoee covert, glossy supercoil, delicate vertigo and cupped vertigo may occur within the affected areas though none were found during surveys. Because these species occur within leaf litter, some individual losses could occur as a result of any ground disturbance. Where burning takes place, habitat conditions would be altered as available leaf litter is reduced. Protective cover would be lost making individuals more susceptible to predation resulting in movements to more favorable habitat (unburned areas). Not all suitable habitat would be impacted within an area. The prescribed burn should not impact moist ravines, coves, springs and seepage areas, and rock outcrops. Individuals at these sites would not be impacted, allowing populations to persist in the area. Any impacts from the burns should be short-term and habitat suitability would increase towards previous levels as leaf litter accumulates over time. Herbicide use, planting, and maintenance of wildlife openings would not affect the snails.

Plants

Non-vascular plants: *Ditrichum ambiguum*, *Homaliadelphus sharpii*

These species were not found during botanical surveys. *Ditrichum ambiguum* and *Homaliadelphus sharpii* are mosses that have been included in this analysis based upon their published habitat descriptions which are sufficiently vague to possibly include the areas considered for prescribed burning. If present within prescribed burn areas, these species would be found associated either with mesic microsites or rock outcrops within the more xeric habitats. These areas are not likely to burn. Some individuals may be impacted, but effects would be minimal. The use of prescribed fire will not negatively impact rare plant populations that naturally occur on these sites. The use of prescribed fire during the growing season is designed to restore these plant communities to a more natural species assemblage, and will likely have a long-term beneficial effect on rare plant species and other organisms that are associated with xeric woodlands.

Vascular plants:

Aster georgianus, *Berberis canadensis*, *Botrychium jenmanii*, *Buckleya distichophylla*, *Delphinium exaltatum*, *Diervilla rivularis*, *Fothergilla major*, *Gentiana austromontana*, *Isotria medeoloides*, *Lysimachia fraseri*, *Monotropsis odorata*, *Penstemon smallii*, *Pycnanthemum beadleii*, *Sedum nevii*, *Thaspium pinnatifidum*, *Thermopsis mollis* var. *fraxinifolia*, *Trillium rugelii* and *Tsuga caroliniana*

These plants are evaluated here for effects of prescribed burning. Six of the plant species evaluated (*Aster georgianus*, *Berberis canadensis*, *Diervilla rivularis*, *Gentiana austromontana*, *Lysimachia fraseri*, and *Thaspium pinnatifidum*) respond favorably to fire in their habitat as documented in current literature. Seven more species (*Buckleya distichophylla*, *Tsuga caroliniana*, *Delphinium exaltatum*, *Fothergilla major*, *Isotria medeoloides*, *Monotropsis odorata*, and *Thermopsis mollis* var. *fraxinifolia*) have at least anecdotal information in the literature or observations that would suggest a favorable or neutral response. The remaining species either have vague habitat descriptions and were thus considered in this analysis as a means of being thorough (*Botrychium jenmanii*, and *Pycnanthemum beadleii*) or occur in xeric habitats (*Penstemon smallii*) but no information on the effects of fire on the species could be found.

Sedum nevii and *Trillium rugelii* are included because they were located during previous surveys of the area. *Sedum nevii* have been found along bluffs and roadsides and the *Trillium* was located near a campground. These locations would be protected and avoided during burning and any other activity which may impact them. There would be no effects to them.

Proposed fire lines generally tie into existing roads or other natural fire breaks (riparian area), and do not impact habitats for the non-vascular species. The proposed burns would likely be dormant season burns that are designed to consume small fuels, but not affect large down wood or mature trees. These fires generally will not carry through moist habitats or areas without adequate small fuels. Some burns may take place during the growing season, especially in site preparation burns or in areas designated as woodland restoration areas. Habitats for the non-vascular and the vascular species that occupy moist habitats including seeps, streams, moist rock, rotten wood, and humid areas may occur within a large burn block but would not be affected by the burns. Similarly, the timing and intensity of the fires would protect vascular plant species and their habitats from negative effects.

The use of prescribed fire during the growing season is designed to restore these plant communities to a more natural species assemblage, and will likely have a long-term beneficial effect on rare plant species and other organisms that are associated with xeric woodlands. Some individuals could be damaged, but roots should remain intact. Dormant season burning would not affect the plants.

Cumulative Effects

Cumulative effects analysis is based on the activities in Table 2 in addition to the proposed action.

Table 2. Past, Present, and Reasonably Foreseeable Activities in the Greasy Creek Project Area

Past	Present	Reasonably Foreseeable
Slickrock Timber Sale 2005, Mulepen ???, Pine beetle salvage in recreation area and NFSR77 and 185		
	Impacts from Hemlock Woolly Adelgid	Impacts from Hemlock Woolly Adelgid
Impacts from Southern Pine Beetle	Restoration of areas impacted from Southern Pine Beetle	Restoration of areas impacted from Southern Pine Beetle
Recreational Uses: Dispersed hunting/fishing, campgrounds, hiking, mtn bike, Chilhowee Rec Area improvements Ocoee Scenic Byway	Recreational Uses: Dispersed hunting/fishing campgrounds, hiking, mtn bike Chilhowee Rec Area improvements Ocoee Scenic Byway	Recreational Uses: Dispersed hunting/fishing campgrounds, hiking, expand mtn bike, increase use therefore increased development Ocoee Scenic Byway
Private land, harvest of tract 640 acres school tract	Private land	Private land
Utility ROW's /electronic sites	Utility ROW's electronic sites	Utility ROW's electronic sites
		New trail projects (Forest Trails Strategy) hiking
Prescribed Burns	Prescribed Burns	Prescribed Burns
Confederate camp, CCC camp at 4-H camp, group picnic and gazebo at Chilhowee and other ccc remnants at CRA, Cherokee path/road east/west Kimsey Highway	Confederate camp, CCC camp at 4-H camp, group picnic and gazebo at Chilhowee and other ccc remnants at CRA, Cherokee path/road east/west Kimsey Highway	Confederate camp, CCC camp at 4-H camp, group picnic and gazebo at Chilhowee and other ccc remnants at CRA, Cherokee path/road east/west Kimsey Highway
Bald Eagle, Tennessee Dace	Bald Eagle, Tennessee Dace	Bald Eagle, Tennessee Dace
4-HCamp Special Use	4-H Camp Special Use	4-H Camp Special Use
Rock Creek Scenic Area	Rock Creek Scenic Area	Rock Creek Scenic Area
Seed Orchard	Seed Orchard	Seed Orchard
		Noxious Weeds treatments

Past	Present	Reasonably Foreseeable
Bridge Reconstruction on Rock Creek and Clear Creek Hwy 30		
		Corridor K 64 construction

Alternative A: No action

There would be no cumulative effects by non-action.

Alternative B:

Haliaeetus leucocephalus

There would be no cumulative effects to the bald eagle with Alternative B.

***Speyeria diana*, Snails, Bats**

Given the short term impacts, dispersed locations, and small impacted area of the past, present, and reasonably foreseeable activities in the Greasy Creek project area no cumulative impacts are expected. Any areas impacted by hemlock wooly adelgid are not likely to be in the same areas as the activities of the proposed actions.

Plants

Plants would incur no cumulative effect from the proposed action and past, present, and reasonably foreseeable activities. The activities are short term, in widely dispersed locations, and/or have a small impact area. Impacts from hemlock wooly adelgid are unknown at this time, however effects are not imminent. Any areas impacted by hemlock wooly adelgid are not likely to be in the same areas as the activities of the proposed actions. In addition, Eastern hemlock is to be retained according to Forestwide Standard 60, thus retaining the community in this proposal.

DETERMINATIONS OF EFFECT

Table 3 summarizes the determinations of effect for each species.

Table 3. Determinations of Effect

Scientific Name	Determination of Effect-Alternative A	Determination of Effect-Alternative B
<i>Plethodon aureolus</i>	No effect. No activities would occur; no habitat would be affected.	May impact individuals, but not likely to cause a trend to federal listing or a loss of viability. Negative effects short term.
<i>Plethodon teyahalee</i>	No effect. No activities would occur; no habitat would be affected.	May impact individuals, but not likely to cause a trend to federal listing or a loss of viability. Negative effects short term.
<i>Haliaeetus leucocephalus</i>	No effect. No activities would occur; no habitat would be affected.	May impact individuals, but not likely to cause a trend to federal listing or a loss of viability. Negative effects short term and localized
<i>Speyeria diana</i>	No effect: No activities would occur; no habitat would be affected.	May impact individuals, but not likely to cause a trend to federal listing or a loss of viability. Negative effects short term.
<i>Corynorhinus</i>	No effect: No activities would occur; no habitat would be	May impact individuals, but not likely to

<i>rafinesquii</i>	affected.	cause a trend to federal listing or a loss of viability. Negative effects short term.
<i>Myotis leibii</i>	No effect: No activities would occur; no habitat would be affected.	May impact individuals, but not likely to cause a trend to federal listing or a loss of viability. Negative effects short term.
<i>Myotis sodalis</i>	No effect: No activities would occur; no habitat would be affected.	Alternative B is not likely to adversely affect the <i>Myotis sodalis</i> . The proposed action is consistent with the Cherokee National Forest RLRMP.
<i>Paravitrea placentula</i>	No effect: No activities would occur; no habitat would be affected.	May impact individuals, but not likely to cause a trend to federal listing or a loss of viability. Negative effects short term.
<i>Patera archeri</i>	No effect: No activities would occur; no habitat would be affected.	May impact individuals, but not likely to cause a trend to federal listing or a loss of viability. Negative effects short term.
<i>Vertigo bollesiana</i>	No effect: No activities would occur; no habitat would be affected.	May impact individuals, but not likely to cause a trend to federal listing or a loss of viability. Negative effects short term.
<i>Vertigo clappi</i>	No effect: No activities would occur; no habitat would be affected.	May impact individuals, but not likely to cause a trend to federal listing or a loss of viability. Negative effects short term.
<i>Ditrichum ambiguum</i>	No effect: No activities would occur; no habitat would be affected.	May impact individuals but not likely to cause a trend toward federal listing or loss of viability. Negative impacts are short-term.
<i>Homaliadelphus sharpii</i>	No effect: No activities would occur; no habitat would be affected.	May impact individuals but not likely to cause a trend toward federal listing or loss of viability. Negative impacts are short-term.
<i>Aster georgianus</i>	No effect: No activities would occur; no habitat would be affected.	May impact individuals but not likely to cause a trend toward federal listing or loss of viability. Negative impacts are short-term. Long-term beneficial.
<i>Berberis canadensis</i>	No effect: No activities would occur; no habitat would be affected.	May impact individuals but not likely to cause a trend toward federal listing or loss of viability. Negative impacts are short-term. Long-term beneficial.
<i>Botrychium jenmanii</i>	No effect: No activities would occur; no habitat would be affected.	May impact individuals but not likely to cause a trend toward federal listing or loss of viability. Negative impacts are short-term.
<i>Buckleya distichophylla</i>	No effect: No activities would occur; no habitat would be affected.	May impact individuals but not likely to cause a trend toward federal listing or loss of viability. Negative impacts are short-term. Long-term probably beneficial.
<i>Delphinium exaltatum</i>	No effect: No activities would occur; no habitat would be affected	May impact individuals but not likely to cause a trend toward federal listing or loss of viability.
<i>Diervilla rivularis</i>	No effect: No activities would occur; no habitat would be affected	May impact individuals but not likely to cause a trend toward federal listing or loss of viability.
<i>Fothergilla major</i>	No effect: No activities would occur; no habitat would be affected.	May impact individuals but not likely to cause a trend toward federal listing or loss of viability.
<i>Gentiana austromontana</i>	No effect: No activities would occur; no habitat would be affected.	May impact individuals but not likely to cause a trend toward federal listing or loss of viability. Negative impacts are short-term. Long-term beneficial.
<i>Isotria medeoloides</i>	No effect: No activities would occur; no habitat would be affected.	Not likely to adversely effect (pers. comm. Jim Widlak 4/25/05)

<i>Lysimachia fraseri</i>	No effect: No activities would occur; no habitat would be affected.	May impact individuals but not likely to cause a trend toward federal listing or loss of viability. Negative impacts are short-term. Long-term beneficial.
<i>Monotropsis odorata</i>	No effect: No activities would occur; no habitat would be affected.	May impact individuals but not likely to cause a trend toward federal listing or loss of viability. Benefit from opening understory, negative impacts are short term.
<i>Penstemon smallii</i>	No effect: No activities would occur; no habitat would be affected.	May impact individuals but not likely to cause a trend toward federal listing or loss of viability. Negative impacts are short-term.
<i>Pycnanthemum beadlei</i>	No effect: No activities would occur; no habitat would be affected.	May impact individuals but not likely to cause a trend toward federal listing or loss of viability. Negative impacts are short-term.
<i>Sedum nevii</i>	No effect: No activities would occur; no habitat would be affected.	No effect. Known populations protected.
<i>Thaspium pinnatifidum</i>	No effect: No activities would occur; no habitat would be affected.	May impact individuals but not likely to cause a trend toward federal listing or loss of viability. Negative impacts are short-term. Long-term beneficial.
<i>Thermopsis mollis</i> <i>var. fraxinifolia</i>	No effect: No activities would occur; no habitat would be affected.	May impact individuals but not likely to cause a trend toward federal listing or loss of viability.
<i>Trillium rugelii</i>	No effect: No activities would occur; no habitat would be affected.	No effect. Known populations protected.
<i>Tsuga caroliniana</i>	No effect: No activities would occur; no habitat would be affected.	May impact individuals but not likely to cause a trend toward federal listing or loss of viability. Negative impacts are short-term. Long-term probably beneficial.

Alternatives A and B will have no direct, indirect or cumulative effects on the Endangered *Myotis grisescens*. Alternative A will have no direct, indirect or cumulative effects on the Endangered *Isoetes medeoloides*, or *Myotis sodalis*. Alternative B is not likely to adversely affect the *Isoetes medeoloides* or *Myotis sodalis*. The USDI, Fish and Wildlife Service concurs with these findings.

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 USDI, Fish and Wildlife Service is not required.

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South Zone Wildlife Biologist

May 5, 2008

Attachment A
CHEROKEE NATIONAL FOREST
 Threatened, Endangered and Sensitive Species 2001 List
 Revised 2/5/2008 by lml

PRC*	Scientific Name	Common Name	Range/Watersh/Co*	CNF Records	Habitat Information	TES	G-Rank
Amphibians							
1a	<i>Desmognathus carolinensis</i>	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	<i>Desmognathus santeetlah</i>	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	<i>Eurycea junaluska</i>	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	<i>Plethodon aureolus</i>	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	<i>Plethodon teyahalee</i>	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	<i>Plethodon welleri</i>	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	<i>Microhexura montivaga</i>	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	<i>Falco peregrinus</i>	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	<i>Haliaeetus leucocephalus</i>	Bald eagle	US and CAN	2 TDEC records; active nest at Parksville Lake 2006-7; hacking S. Holston Lake 1991-94; other 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.	S	G5
1a	<i>Lanius ludovicianus migrans</i>	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	<i>Cottus baileyi</i>	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	<i>Cyprinella caerulea</i>	Blue shiner	C	2 occ. Conasauga & Jack's Rivers	Large streams, small to medium-sized rivers, moderate gradient, low elevation	T	G2
1a	<i>Erimonax monachus</i>	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	<i>Etheostoma acuticeps</i>	Sharphead darter	N	1 occ. Nolichucky R.	Large creeks to medium rivers, moderate gradient, cool warm water	S	G2G3

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1a	<i>Etheostoma brevirostrum</i>	Holiday Darter	C	2 occ. Conasauga & Jack's Rivers	Large streams to medium rivers, moderate gradient, low elevation	S	G2
1a	<i>Etheostoma percnurum</i>	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	<i>Etheostoma vulneratum</i>	Wounded darter	LT, FB (extirpated)	1 occ. Citico Creek	Small to large rivers, low to moderate gradient, low to moderate elevations	S	G3
2a	<i>Ichthyomyzon greeleyi</i>	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	<i>Noturus baileyi</i>	Smoky madtom	LT	1 occ. Citico Creek; Experimental pop. being introduced into Tellico R.	Large streams, low gradient, low elevation.	E	G1
1a	<i>Noturus flavipinnis</i>	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	<i>Percina antesella</i>	Amber darter	C	Conasauga River < 5 miles from Forest Bdy.	Large streams and small rivers, low gradient, low elevation	E	G1
2a	<i>Percina burtoni</i>	Blotchside logperch	H, SH (extirpated)	2 occ. Spring Cr. & Hiwassee R.	Large streams to small rivers, moderate gradient, low elevation	S	G2
1a	<i>Percina jenkinsi</i>	Conasauga logperch	C	1 occ. Conasauga River; possibly in Jack's R.	Medium river, moderate gradient, low elevation	E	G1
1a	<i>Percina macrocephala</i>	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	<i>Percina palmaris</i>	Bronze darter	C	2 occ. Conasauga & Jack's Rivers	Small to medium rivers, moderate gradient, low elevation.	S	G3
2a	<i>Percina squamata</i>	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
2a	<i>Percina tanasi</i>	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	<i>Phenacobius crassilabrum</i>	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	<i>Phoxinus tennesseensis</i>	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 tribs.	1 st 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

2a	<i>Cheumatopsyche helma</i>	Helma's net-spinning caddisfly	PA, KY, TN, AL	1 occ. Big Lost Cr (Hiwassee)	Large streams, low gradient, low elevation	S	G1G3
1a	<i>Dixioria fowleri</i>	A millipede	VA, TN, Laurel Fork drainage in VA; Beaverdam Crk in TN	1 occ., Holston Mtn near Backbone Rock	Leaf litter, deciduous forests	S	G2
2a	<i>Gomphus consanguis</i>	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	<i>Gomphus viridifrons</i>	Green-faced clubtail	Ontario to AL	1 TWRA record; Chestoa, Nolichucky R. 2001	Small-large rivers, moderate gradient	S	G3
2a	<i>Macromia margarita</i>	Mountain river cruiser	VA to GA	0 records	Small streams to large rivers, rocky with silt deposits	S	G2G3
1a	<i>Megaleuctra williamsae</i>	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	<i>Ophiogomphus alleghaniensis</i>	Allegheny Snaketail	WV, VA, TN, AL	0 TDEC records; known from Polk Co. & GSMNP	Spring-fed Piedmont streams	S	G3Q
1a	<i>Ophiogomphus edmundo</i>	Edmund's snaketail	TN, NC, GA	1 occ. Conasauga R.	Large streams, low gradient, low elevation	S	G1

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2a	<i>Ophiogomphus incurvatus</i>	Appalachian snaketail	PA, TN, NC, GA	Conasauga River < 5 miles from CNF	Small streams, low gradient	S	G3
4a	<i>Speyeria diana</i>	Diana fritillary	WV to AL	23 TDEC records, Monroe, Cocke, Greene, Carter, Johnson, Sullivan, Unicoi, Washington Cos.	Mature mesic forests, edges & grassy openings; caterpillar host is <i>Viola</i> sp.	S	G4
Mammals							
4a	<i>Corynorhinus rafinesquii</i>	Rafinesque's big-eared bat	OH to MO, south to FL and LA; OK, TX	1 TDEC record; Cocke Co.	Caves & mine portals; summer roosts in hollow trees, under loose bark, & abandoned buildings; forages primarily in mature forest	S	G3G4
1a	<i>Glaucomys sabrinus coloratus</i>	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	<i>Microtus chrotorrhinus carolinensis</i>	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
2a	<i>Myotis grisescens</i>	Gray bat	VA to KS south, from TN to OK; SC to FL, AL	4 TDEC records, Cocke & Greene Cos.; pvt in Carter & Sullivan Cos.	Uses caves year round; forages along riparian areas/shorelines with forest cover	E	G3
4a	<i>Myotis leibii</i>	Eastern small-footed bat	ME to OH south, from SC to AL; AR, MO, OK; CAN: ON, QC	16 TDEC records, Polk, Monroe, Cocke, Greene, Unicoi, Carter, Johnson, Sullivan Cos.	Bridges, cliffs, mine portals, buildings; summer roosts buildings, hollow trees, loose bark	S	G3
4a	<i>Myotis sodalis</i>	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
2a	<i>Sorex palustris punctulatus</i>	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	<i>Alasmidonta raveneliana</i>	Appalachian elktoe	N	1 occ. Nolichucky R.	Small to medium rivers, moderate gradient, moderate elevation	E	G1
1a	<i>Epioblasma florentina walkeri</i>	Tan riffleshell	H	2 occ Hiwassee R. #4 & #5	Small to large rivers, low gradient, low elevation	E	G1T1
1a	<i>Epioblasma metastrata</i>	Upland combshell	C	0 occ Critical Habitat	Large streams to medium rivers, low to moderate gradient, low elevation	E	GH
1a	<i>Epioblasma othcaloogensis</i>	Southern acornshell	C	0 occ Critical Habitat	Large streams to medium rivers, low to moderate gradient, low elevation	E	GHQ
1a	<i>Fusconaia barnesiana</i>	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	<i>Lampsilis altilis</i>	Finelined pocketbook	C	1 occ. Conasauga R. last obs 1999	Large streams to medium rivers, low to moderate gradient, low elevation	T	G2
1a	<i>Lasmigona holstonia</i>	Tennessee Heelsplitter	H, FB	Hiwassee and French Broad tribs. < 5 miles from the Forest Bdy.	Small streams to small rivers, low to moderate gradient, low elevation	S	G3
1a	<i>Lasmigona subviridis</i>	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	<i>Lexingtonia dolabelloides</i>	Slabside pearlymussel	H	2 occ Hiwassee R. #4 & #5	Small streams to large rivers, moderate to high gradient, low elevation	S{C}	G2
1a	<i>Medionidus acutissimus</i>	Alabama moccasinshell	C	0 occ Critical Habitat	Large streams, low gradient, low elevation	T	G1
1a	<i>Medionidus parvulus</i>	Coosa moccasinshell	C	0 occ Critical Habitat	Large streams, low gradient, low elevation	E	G1
1a	<i>Pleurobema decisum</i>	Southern clubshell	C	0 occ Critical Habitat	Large streams to medium rivers, low to moderate gradient, low elevation	E	G1G2

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1a	<i>Pleurobema georgianum</i>	Southern pigtoe mussel	C	1 occ. Conasauga R.	Medium rivers, moderate gradient, low elevation	E	G1
1a	<i>Pleurobema hanleyianum</i>	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	<i>Pleurobema oviforme</i>	Tennessee clubshell	H	2 occ Hiwassee R. #4 & #5	Large streams, low gradient, low elevation	S	G3
1a	<i>Pleurobema perovatum</i>	Ovate clubshell	C	0 occ Critical Habitat	Large streams, low gradient, low elevation	E	G1
1a	<i>Ptychobranchus greenii</i>	Triangular kidneyshell	C	0 occ Critical Habitat	Large streams, low gradient, low elevation	E	G1
1a	<i>Strophitus connasaugaensis</i>	Alabama creekmussel	C	1 occ. Conasauga R.	Large streams, low gradient, low elevation	S	G3
1a	<i>Villosa nebulosa</i>	Alabama rainbow	C	1 occ. Conasauga R.	Large streams, low gradient, low elevation	S	G3
1a	<i>Villosa trabalis</i>	Cumberland bean pearly mussel	H	2 occ Hiwassee R. #4 & #5	Large streams and small rivers, low gradient, low elevation	E	G1G2
1a	<i>Villosa vanuxemensis umbrans</i>	Coosa combshell	C	1 occ. Conasauga R.	Small and large streams, low gradient, low elevation	S	G4T2
Reptiles							
1a	<i>Glyptemys muhlenbergii</i> (S. pop)	Bog turtle	MA south to GA, TN	1 TDEC record Johnson Co.; CNF record Carter Co.	Slow, shallow, mucky rivulets of sphagnum bogs, seeps, wet cow pastures, & shrub swamps	T (SA)	G3
Snails							
1a	<i>Pallifera hemphilli</i>	Black mantleslug	MI, NC, TN, GA, 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
7a	<i>Paravitrea placentula</i>	Glossy supercoil	VA, TN, NC, KY Off-forest Cocks Co.; unk location Sullivan Co.	0 TDEC records; Field Museum & CNF records Polk(2), Monroe(2), Carter(2), Unicoi(1) Cos.	Leaf litter of deciduous forests and streamside forests with moist litter, downed wood & rock cover.	S	G3
7a	<i>Patera archeri</i>	Ocoee covert	Polk County, TN	3 CNF records Polk County	Leaf litter under rock ledges in ravines; Ocoee River drainage endemic	S	G1
1a	<i>Ventridens coelaxis</i>	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
7a	<i>Vertigo bollesiana</i>	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
7a	<i>Vertigo clappi</i>	Cupped vertigo	KY, TN, VA, WV	5 TDEC records Monroe Co.; 1 TDEC record Carter Co.	leaf litter and debris on steep wooded slopes with boulders and rotting timber	S	G1G2
Non-vascular Plants							
1a	<i>Acrobolbus ciliatus</i>	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?
7a	<i>Aneura maxima</i> (=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	<i>Aspiromitus appalachianus</i>	A hornwort	TN, NC, SC	Undocumented records have been reported.	On rock in streams. Riparian dependent.	S	G1
2a	<i>Bartramidula wilsonii</i>	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 mtns, especially road cuts. Also on spray cliffs and in humid gorges. Mostly riparian dependent.	S	G3?
2a	<i>Bazzania nudicaulis</i>	A liverwort	Mountains of VA, TN, and NC	2 locations; Roan Mountain	On rock and bark of <i>Abies fraseri</i> , <i>Picea rubens</i> , <i>Betula lutea</i> , <i>Prunus pennsylvanica</i> , and <i>Sorbus americana</i> in spruce/fir forests.	S	G2G3

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2a	<i>Brachydontium trichodes</i>	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	<i>Buxbaumia minakatae</i>	Hump-backed Elves	Nova Scotia, MA, NY, MI, VT, VA, NC and Japan	0 Records	Swampy areas; habitats occupied by <i>Nowellia</i> , <i>Lophocolea</i> , and <i>Tetraphis</i> ; rotten logs or stumps; found on elm, ash and yellow birch logs.	S	G2G3
2a	<i>Cephalozia macrostachya</i> ssp <i>australis</i>	A liverwort	NC to MS	0 Records	On soil in rock crevices along streams. Riparian dependent.	S	G4T1
1a	<i>Cephaloziella massalongi</i>	A liverwort	Europe, VT, TN, and NC	0 Records	Rock crevices and soil above 5,500'. Often with copper or sulphur deposits.	S	G2G3
1a	<i>Cheilolejeunea evansii</i>	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 <i>Quercus</i> spp., <i>Liriodendron tulipifera</i> , <i>Nyssa sylvatica</i> , <i>Carya</i> spp., <i>Liquidambar styraciflua</i> , <i>Fraxinus</i> spp., and <i>Ilex opaca</i> . The moss <i>Fissidens subbasilaris</i> is nearly a constant associate.	S	G1
1a	<i>Chiloscyphus appalachianus</i>	A liverwort	KY, NC, SC, and TN. Monroe Co.	1 Record	On wet rock, usually near cascades or waterfalls. Riparian dependent.	S	G1G2
1a	<i>Diplophyllum apiculatum</i> var <i>taxifolioides</i>	A liverwort	NC, TN The variety <i>taxifolioides</i> 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. <i>Diplophyllum</i> collected below 3,000 feet is likely to be <i>D. apiculatum</i> (Hicks 1992). The variety is thought to be a hybrid of <i>D. apiculatum</i> and <i>D. taxifolioides</i> (Shuster 1974).	S	G5T1Q
1a	<i>Diplophyllum obtusatum</i>	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?
4a	<i>Ditrichum ambiguum</i>	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?
1a	<i>Drepanolejeunea appalachiana</i>	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 <i>Kalmia</i> , <i>Rhododendron</i> , <i>Clethra</i> , and <i>Ilex</i> . Substrates for the CNF pops include rock, <i>Quercus alba</i> , and <i>Betula allegheniensis</i> .	S	G2?
2a	<i>Entodon concinnus</i>	Lime entodon	NC, TN; AB, BC, NS	0 Records.	On moist calcareous rock.	S	G4G5
2a	<i>Fissidens appalachensis</i>	Appalachian pocket moss	NC and TN. Monroe Co.	1 Record.	In rock crevices submerged in swift running, shallow water. Riparian dependent.	S	G2G3
1a	<i>Frullania appalachiana</i>	A liverwort	Mountains of TN, NC, GA, and SC	0 Records.	Usually on the bark of hardwoods (<i>Acer spicatum</i> , <i>Betula allegheniensis</i> , <i>Sorbus americana</i>) above 3,500 ft. in spruce/fir zone. Also known from mesic forests and escarpment gorges on the bark of <i>Castanea dentata</i> and <i>Liriodendron tulipifera</i> .	S	G1?
1a	<i>Frullania oakesiana</i>	A liverwort	Northern Europe, Japan, and Mountains of VT to NC and TN	0 Records.	Tree bark in spruce/fir forests.	S	G3?
1a	<i>Gymnoderma lineare</i>	Rock gnome lichen	TN, NC, SC, GA	1 Record, Roan Mountain	High elevation rocky summits and rock outcrops.	E	G2
1a	<i>Homaliadelphus sharpii</i>	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

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2a	<i>Hydrothyria venosa</i>	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	<i>Lejeunea blomquistii</i>	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
2a	<i>Lejeunea dimorphophylla</i>	A liverwort	The Caribbean; coastal plain of FL and NC	1 possible Record, Monroe County. This has proven to be <i>Lejeunea ulicina</i> ssp. <i>bullata</i> .	On bark of trees in the outer coastal plain. Riparian dependent.	S	G2G3
1a	<i>Leptodontium excelsum</i>	Grandfather Mountain leptodontium	VA, TN, NC, and GA	Unkown # on Roan Mountain	Bark of trees in high elevation, spruce/fir forests.	S	G2
1a	<i>Leptohymenium sharpii</i>	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
1a	<i>Lophocolea appalachiana</i>	A liverwort		see <i>Chiloscyphus appalachianus</i>	See <i>Chiloscyphus appalachianus</i>	S	G1G2?
1a	<i>Marsupella emarginata</i> var. <i>latiloba</i>	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
7a	<i>Megaceros aenigmaticus</i>	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	<i>Metzgeria fruticulosa</i> (= <i>M. temperata</i>)	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
1a	<i>Metzgeria furcata</i> var. <i>setigera</i>	A liverwort	NC and SC, possibly TN	0 Records.	In humid gorges or on damp, shaded rocks in spruce/fir forests.	S	G4T1
1a	<i>Metzgeria uncigera</i>	A liverwort	PR; SE coast to mountains of NC	0 Records.	On <i>Rhododendron</i> bark in mountains.	S	G3
2a	<i>Nardia lescurii</i>	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	<i>Pellia appalachiana</i>	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	<i>Plagiochila austinii</i>	A liverwort	NH and VT to NC and TN	0 Records.	On shaded, moist rock outcrops in the mountains	S	G3
2a	<i>Plagiochila caduciloba</i>	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
1a	<i>Plagiochila echinata</i>	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
1a	<i>Plagiochila sharpii</i>	Sharp's leafy liverwort	TN, NC, SC, and GA	0 Records.	Shaded, moist rocks in humid gorges. Riparian dependent.	S	G2G3
1a	<i>Plagiochila sullivantii</i> var. <i>spinigera</i>	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	<i>Plagiochila sullivantii</i> var. <i>sullivantii</i>	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	<i>Plagiochila virginica</i> var. <i>caroliniana</i>	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

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2a	<i>Plagiochila virginica</i> var <i>virginica</i>	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	<i>Plagiomnium</i> <i>carolinianum</i>	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	<i>Platyhypnidium</i> <i>pringlei</i>	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	<i>Polytrichum</i> <i>appalachianum</i>	Appalachian haircap moss	TN and NC	0 Records.	High elevation rocky summits, rock outcrops, and shrub balds.	S	G3
2a	<i>Porella wataugensis</i>	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	<i>Radula sullivantii</i>	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
1a	<i>Radula voluta</i>	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	<i>Riccardia jugata</i>	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	<i>Sphenolobopsis</i> <i>pearsonii</i>	A liverwort	Europe, Africa, Asia, Atlantic and Pacific Islands, Pacific NW; NC and TN	Roan Mountain (Undocumented)	On rock and bark of <i>Abies fraseri</i> , <i>Picea rubens</i> , <i>Prunus pennsylvanica</i> , and <i>Sorbus americana</i> in spruce/fir forests.	S	G2
1a	<i>Sticta limbata</i>	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	<i>Taxiphyllum alternans</i>	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	<i>Tortula ammonsiana</i>	Ammons' tortula	Africa; WV, NC, and TN	0 Records.	Cliff overhangs and crevices with seepage in rich hardwood forests. Riparian dependent.	S	G2?
<i>Vascular Plants</i>							
1a	<i>Aconitum reclinatum</i>	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	<i>Aster georgianus</i>	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	<i>Berberis canadensis</i>	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	<i>Botrychium jenmanii</i>	Dixie grapefern	MD to FL; TN, AL, MS, LA. Monroe, Hamblen, Putnum Co's.	0 Records	Dry to moist forests; open, grassy areas; and disturbed areas.	S	G3G4
4a	<i>Buckleya</i> <i>distichophylla</i>	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	<i>Calamagrostis cainii</i>	Cain's reed grass	Mountains of NC, TN. Sevier Co.	0 Records	High elevation rocky summits and disturbed areas 4000-6000 ft.	S	G1

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1a	<i>Cardamine clematitidis</i>	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	<i>Carex misera</i>	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	<i>Carex roanensis</i>	Roan sedge	GA, KY, NC, TN, VA. Carter, Johnson, Unicoi, Coker, Sullivan	25 Records	Mesic forests; often associated with birch and beech at high elevations.	S	G1
1a	<i>Cimicifuga rubifolia</i>	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
7a	<i>Collinsonia verticillata</i>	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
7a	<i>Coreopsis latifolia</i>	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
2a	<i>Danthonia epilis</i>	Bog oat-grass	GA, NC, NJ, SC, TN. Coker	0 Records	Seeps around rock outcrops in the mountains. Riparian dependent.	S	G3?
4a	<i>Delphinium exaltatum</i>	Tall larkspur	OH, PA south to TN, NC; AL, MO, ME. Mostly Ridge and Valley Co's, but reported from Coker 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
7b	<i>Diervilla rivularis</i>	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	<i>Fothergilla major</i>	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
4a	<i>Gentiana austromontana</i>	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	<i>Geum geniculatum</i>	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	<i>Geum radiatum</i>	Spreading avens	Mountains of NC, TN. Sevier, Blount, Carter.	3 Records	Thin soil on rocky summits, cliffs, & ledges; open, grassy balds near <i>Rhododendron catawbiense</i> ; >4200'.	E	G1
1a	<i>Glyceria nubigena</i>	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 miry places in spruce-fir forests	S	G2
1a	<i>Hedyotis purpurea</i> var. <i>montana</i>	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	<i>Helianthus glaucophyllus</i>	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	<i>Heuchera longiflora</i> var. <i>aceroides</i>	Maple-leaf alumroot	Range for <i>H. longiflora</i> is AL, KY, NC, OH, TN, VA, WV. No published range info for variety. Coker, Greene Cos.	9 Records	Moist ravines and rich cove forests, especially over mafic or calcareous rock.	S	G4T2Q
2a	<i>Hymenophyllum tayloriae</i>	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

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1a	<i>Hypericum graveolens</i>	Mountain St. Johnswort	Mountains of NC, TN. Sevier, Unicoi, Carter, Johnson.	3 Records	High elevation grassy balds and forest openings.	S	G3
1a	<i>Hypericum mitchellianum</i>	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	<i>Ilex collina</i>	Longstalked holly	NC, VA, WV. Suspected in TN	0 Records	Wetlands, seeps, or streambanks >2,000 ft often in association with <i>Tsuga canadensis</i> , <i>Betula lenta</i> , <i>Ilex montana</i> , <i>Picea rubens</i> , and <i>Rhododendron maximum</i> . Also moist, rocky slopes in northern hardwood or mixed spruce/hardwood forests.	S	G3
4a	<i>Isotria medeoloides</i>	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
2a	<i>Juglans cinerea</i>	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
2a	<i>Lilium grayi</i>	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
7b	<i>Lysimachia fraseri</i>	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
2a	<i>Minuartia godfreyi</i>	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	<i>Monotropsis odorata</i>	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	<i>Penstemon smallii</i>	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	<i>Pityopsis ruthii</i>	Ruth's golden aster	Southeast TN	12 Records; Polk Co.	Crevices in phyllite & graywacke boulders in historical flood zone Ocoee & Hiwassee Rivers.	E	G1
2a	<i>Platanthera integrilabia</i>	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 <i>Sphagnum</i> and <i>Osmunda cinnamomea</i> , <i>Woodwardia areolata</i> , and <i>Thelyptris novaboracensis</i> , in acidic muck or sand, and in partially, but not fully shaded areas.	S	G2G3
2a	<i>Potamogeton tennesseensis</i>	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	<i>Prenanthes roanensis</i>	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	<i>Pycnanthemum beadlei</i>	Beadle's mountain mint	Mountains of southwest VA to GA, TN. Carter	0 Records	Forests and woodland borders.	S	G2G4

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1a	<i>Rosa obtusiuscula</i>	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 <i>Rosa palustris</i> . At this point it is considered to be "State Historic".	S	G1G3Q
1a	<i>Rugelia nudicaulis</i>	Rugel's Indian plantain	Mountains of NC, TN, Cocke, Sevier, Blount	0 Records	Spruce/fir and northern hardwood forest openings	S	G3
2a	<i>Saxifraga caroliniana</i>	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
2a	<i>Scutellaria arguta</i>	Hairy skullcap	GA, KY, NC, TN, VA. Unicoi	0 Records	High to mid elevation forests and moist talus slopes	S	G2?Q
7a	<i>Scutellaria saxatilis</i>	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
7b	<i>Sedum nevii</i>	Nevius' stonecrop	AL, GA, TN. Polk	9 Records all restricted to the Ocoee River Gorge.	Shaded, rocky bluffs and cliffs	S	G3
1a	<i>Sida hermaphrodita</i>	Virginia fanpetals	KY, MD, OH, PA, TN, VA, IN, MI, Ontario. Cocke, Washington, Claiborne	0 Records	Sandy or rocky riverbanks	S	G2
1a	<i>Silene ovata</i>	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	<i>Solidago spithamea</i>	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	<i>Spiraea virginiana</i>	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	<i>Stachys clingmanii</i>	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	<i>Thaspium pinnatifidum</i>	Cutleaved meadow parsnip	AL, GA, KY, NC, OH, TN, VA. Greene, Cocke, Hamilton	1 Record	Forests and woodlands over calcareous rock	S	G3?
7a	<i>Thermopsis mollis</i> var. <i>fraxinifolia</i>	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?
7b	<i>Trillium rugelii</i>	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
7a	<i>Trillium simile</i>	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	<i>Tsuga caroliniana</i>	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.

*Range abbreviations refer to the major watersheds on the Cherokee NF: Conasauga, Ocoee, Hiwassee, Little Tennessee, Pigeon, French Broad, Nolichucky, Watauga, and South Holton.

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*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

small 3, 4

medium 5, 6, 7

large 8, 9

Gradients

low $\leq 2\%$

moderate $> 2\% - \leq 4\%$

high $> 4\%$

Elevations

low $\leq 1200'$

high $> 1200'$

Attachment B
List for determining the Project Review Code (PRC) for each TES Species

1a = The project is located out of the species known range, or suitable habitat does not exist in the project area.

2a = All requisite habitat has been identified and excluded from disturbance associated with the project. Therefore, the project is expected to have no effects regardless of the number and location of individuals in the area affected by the project.

3a = The project is being implemented for the benefit of the species, and is expected to have totally beneficial effects regardless of the number and location of individuals in the area affected by the project.

4a = It is assumed that the species is present. Additional information on the number and location of individuals is not needed to improve the design and/or application of mitigation to reduce adverse effects, or to allow a better assessment of effects to viability of the population.

5a = The species is already covered by a current site-specific inventory for the project area and additional inventories are not needed.

6a = Inventory methods are not technically or biologically feasible and effective for providing substantial information on the number and location of individuals. It is assumed that the species is present. Determination of Effect: May impact individuals, but not likely to cause a trend to federal listing or a loss of viability.

7a = A site-specific inventory was conducted, but the species was not found in the project area.

7b = A site-specific inventory was conducted, and the species was found in the project area.

Supplementing BEs Associated with New Projects

For those Forests w/ Revisions after 2002

Supplement to the Biological Evaluation of the Greasy Creek Vegetation Management

As a result of a recent court decision, the Region 8 Supplement to FSM 2670 is no longer in effect. However, the process used to decide when to inventory for PETS species is consistent with FSM 2672.43.

Since the necessary inventories were completed as herein described, the analysis of the effects of the proposed project has not changed, and there will be no change in the determinations of effect.

Mary M. Dodson
BIOLOGIST NAME

January 9, 2009
Date

South Zone Wildlife Biologist
Title