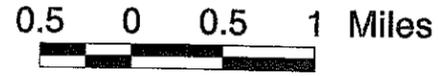
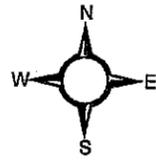


# Flatwoods Project Area

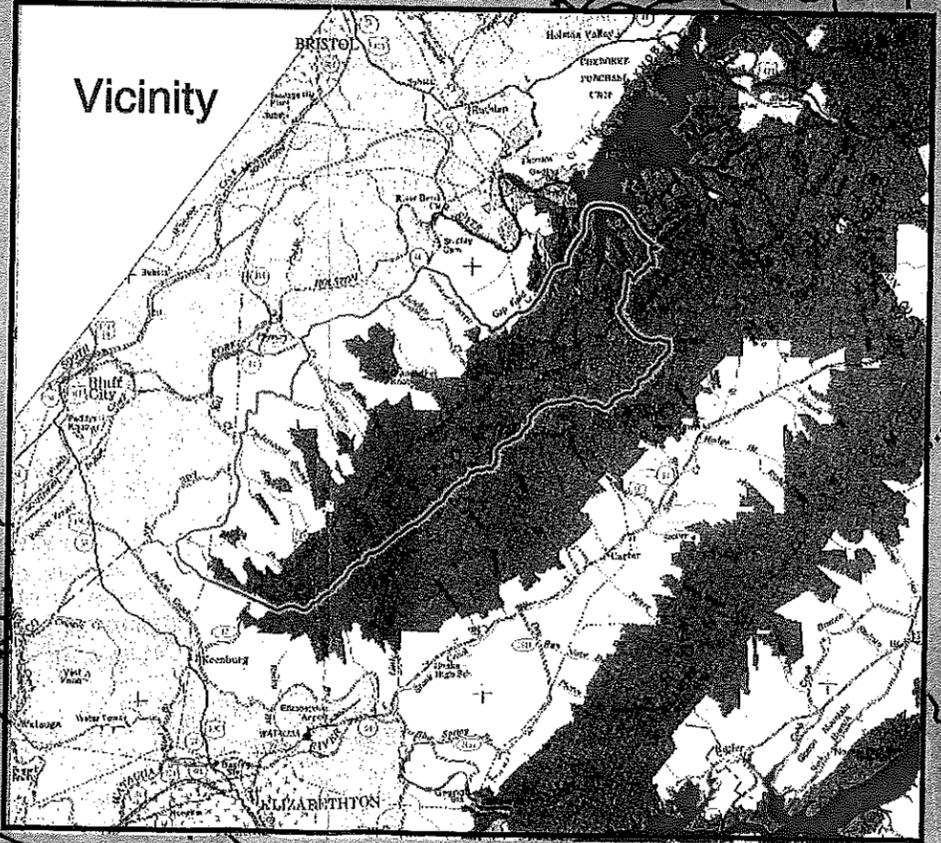
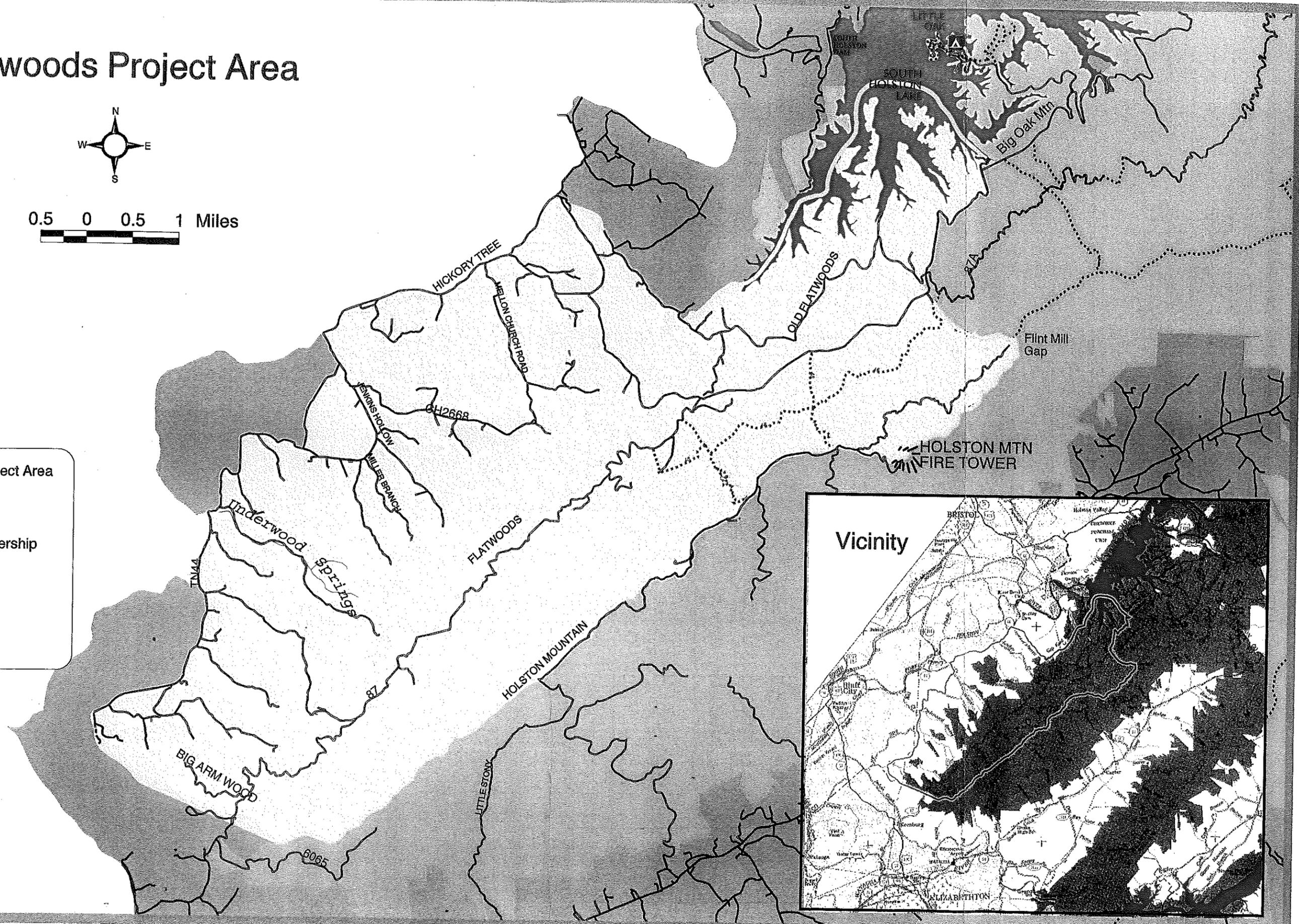


**Ownership in Project Area**

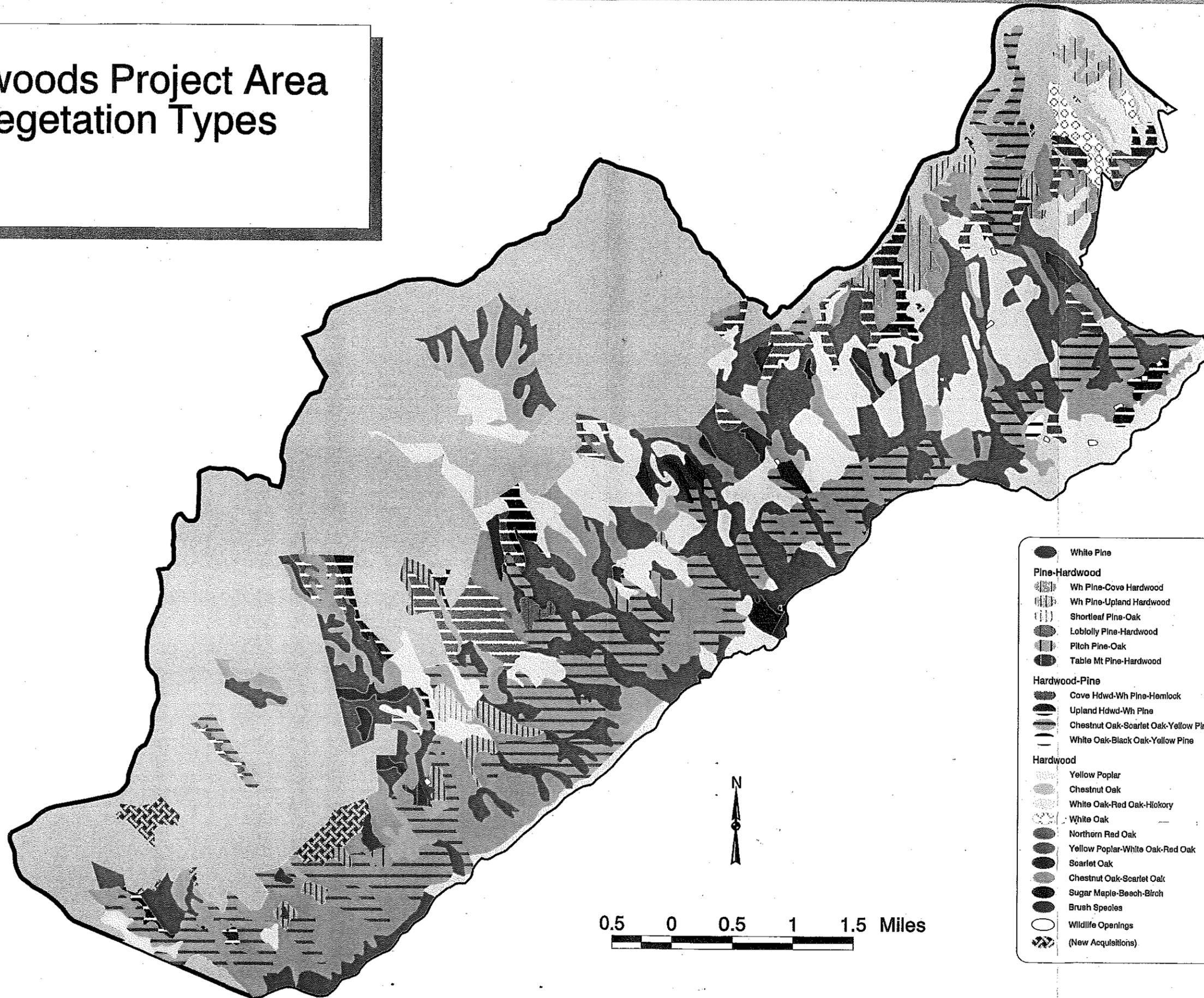
- FS
- PVT

**Surrounding Ownership**

- FS
- PVT
- Roads
- Trails



# Flatwoods Project Area Vegetation Types



	White Pine		Ownership
	<b>Pine-Hardwood</b>		PVT
	Wh Pine-Cove Hardwood		
	Wh Pine-Upland Hardwood		
	Shortleaf Pine-Oak		
	Loblolly Pine-Hardwood		
	Pitch Pine-Oak		
	Table Mt Pine-Hardwood		
	<b>Hardwood-Pine</b>		
	Cove Hdwd-Wh Pine-Hemlock		
	Upland Hdwd-Wh Pine		
	Chestnut Oak-Scarlet Oak-Yellow Pine		
	White Oak-Black Oak-Yellow Pine		
	<b>Hardwood</b>		
	Yellow Poplar		
	Chestnut Oak		
	White Oak-Red Oak-Hickory		
	White Oak		
	Northern Red Oak		
	Yellow Poplar-White Oak-Red Oak		
	Scarlet Oak		
	Chestnut Oak-Scarlet Oak		
	Sugar Maple-Beech-Birch		
	Brush Species		
	Wildlife Openings		
	(New Acquisitions)		



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# Flatwoods Ecosystem Evaluation

## Introduction

The North Zone Interdisciplinary Analysis Team completed an inventory of the Flatwoods Ecosystem Evaluation (FEE) Area to assess resource conditions and identify any needed improvements to these conditions. Differences between desired conditions and current conditions are identified as needs within the area. These needs will be addressed by several possible management practices. This evaluation is intended to achieve the aims of the National Forest Management Act (NFMA), the “left side” of the Forest Plan implementation triangle.

This evaluation is not a decision document. It serves to inform the decision-maker of the possible management practices that will help move the ecosystem toward the desired future condition, and determine what will be brought forward and developed into proposed actions. This process provides a chance to look at the full complement of forces acting on the ecosystem and plan a holistic strategy of management for the future.

## Description of the Area

### Location

The Flatwoods Ecosystem Evaluation area is located in Sullivan County, Tennessee on the northwest side of Holston Mountain between Keensburg Community and Josiah Creek. The area comprises 12,965 acres of National Forest Lands in Compartments 105–115 and 117.

The FEE area is not a single watershed (6<sup>th</sup> level), but rather is a portion of a previously delineated 5<sup>th</sup> level watershed (South Fork Holston River – HUC 06010102040). The area actually includes all or portions of several 4<sup>th</sup> and 5<sup>th</sup> order watersheds that vary in size from 5 to 10 square miles.

The FEE area is located just east of Bluff City, Tennessee in the Blue Ridge Mountains and Ridge and Valley Eco-regions. The Blue Ridge Eco-region is located along the eastern perimeter of the analysis area, and is separated from the Ridge and Valley Eco-region at approximately the location of FDR #87. The FEE area lies in a portion of the South Holston River Basin.

Elevation in the area ranges from just over 4,200 feet above Mean Sea Level (MSL) along the Holston Mountain crest to about 1,500 feet MSL at river mile 37 of the South Fork Holston River.

The FEE area includes the upper watershed of Big Arm Branch, and most of the Morrell Creek, Riddle Creek, Dry Creek, Possum Creek, Hatcher Creek, and Big Creek watersheds. The northeastern portion of the FEE area, that includes the Big Creek and Riddle Creek watersheds, is almost entirely Forest Service ownership. These streams drain into the South Holston Lake. The remainder of the FEE area has an ownership pattern in which the upper watersheds of Big Arm Branch, Dry Creek, Possum Creek, Morrell Creek and Hatcher Creek are in Forest Service ownership, while the lower portion of the watersheds are mostly in private ownership. These streams drain into the South Fork Holston River below the South Holston Lake. The entire analysis area is about 29,400 acres in size. Of this, about 12,965 acres (44%) is National Forest land, while 16,435 acres (56%) are private lands.

## **Physical Elements**

### *Climate*

The FEE area has an average annual temperature of 55 degrees Fahrenheit. January is usually the coldest month with an average temperature of 34 degrees Fahrenheit, while July is usually the hottest month with an average temperature of 75 degrees Fahrenheit. The area averages about 48 inches of precipitation annually, which is distributed fairly evenly throughout the year. July is usually the wettest month with an average of 4.9 inches of precipitation, while October is usually the driest with an average of 2.6 inches of precipitation. The length of the growing season is approximately 180 days per year. Prevailing winds in eastern Tennessee are predominantly from the southwest.

Stream flow varies seasonally with rainfall and the effects of evapo-transpiration. Of the average precipitation of 48 inches, approximately 28 inches infiltrates, evaporates, or is transpired by vegetation, leaving an average annual stream flow of about 20 inches. A larger amount of run-off occurs during the winter and early spring when precipitation events are frequent and long lasting, temperatures are low and evapo-transpiration rates are low.

### *Geology*

The character of the FEE area is dominated by the influence of the two physiographic provinces within the area, and the geology associated with each. The Blue Ridge Province is located along the eastern perimeter of the area, and is defined by Holston Mountain. This mountain trends along a southwest to northeast orientation. Geology associated with this province is composed of members of the Cambrian-aged Chilhowee Formation. This formation is composed primarily of quartzite and dolomite with sandstones and shales. The Ridge and Valley Province is located in the balance of the analysis area. Geology associated with this province is Ordovician-aged limestone, shale, dolomite, siltstone and sandstone. A thrust fault (Holston Mountain) extends in a southwest to northeast direction the entire length of the analysis area and marks the demarcation between the two physiographic provinces. The Holston Mountain Thrust Fault is suspected of directly influencing the development and recharge of the many springs in the area. Precipitation on the northwestern slopes of Holston Mountain enters the subsurface, and flows down gradient until it enters the fractures associated with the fault, and is stored in solutional channels in limestone before emerging as a spring.

### *Soil Characteristics*

There are 29 soil types within this area. They range from ridge-top soils on top of Holston Mountain to cove and toe-slope soils at the bottom of the mountain. Erosion hazard ranges from slight to severe with slopes from 5% to 80%. A detailed list of soil types and characteristics can be found in Appendix A.

### *Erosion Processes*

Surface erosion processes are dominant within the FEE area. The primary source of this erosion on national forest lands is from the existing road and trail system. There is very little evidence of mass wasting. Sources of erosion on private lands include urban development, cropland, grazing, and roads. These land uses can create serious non-point source pollution problems. Neither the main stem of the South Fork Holston River nor tributaries of the river within the analysis area are listed as impaired on the State of Tennessee 303(d) list.

Forest Service roads and trails are the main source of accelerated erosion on national forest lands. Forest Development Road (FDR) #87 that traverses the entire area in an east-west direction provides the primary access within the FEE area. Table 1 displays the access system located within the area. Almost all of these roads are aggregate surfaced, and either in-sloped with ditch and culvert drainage, out-sloped with drainage via dips, or a combination of these. Small sections of some of the roads are paved. Most of the primary access roads such as 87 and 87D are located on side-slope locations. These roads do not parallel stream segments, but do cross several perennial streams. As a rule, these crossings are made by the use of culverts. Generally, the drainage and surfacing features of the roads within the area can be improved to reduce erosion and sediment delivery to streams. These measures could range from additional culverts, or dips to improve surface drainage, surfacing of the road with gravel or chip seal, improved vegetation on cut and fill slopes, and other possible treatments.

Table 1. Forest Service Roads Within FEE area

Road Name	Road #	Mileage	Surface Type	Open/Closed
Flatwoods	87	14.0	Aggregate	Open
Fishdam SE	87A	0.6	Aggregate	Open
Old Flatwoods	87D	4.4	Aggregate	Open
Big Creek	87C	0.3	Aggregate	Open
Hickory Tree	251	0.9	Aggregate	Open
Flint Mill Gap	4202	3.0	Aggregate	Closed
FAA VOR	202C	.35	Aggregate	Closed
Morrill Creek	610820	0.5	Aggregate	Closed
Upper Hatcher Ck	610901	0.7	Aggregate	Closed
Miller Branch	6113	1.2	Aggregate	Closed
Keener Spur	61101	0.3	Aggregate	Closed
Big Arm Wood	6112	1.0	Aggregate	Closed

Several unclassified roads are present within the FEE area. Most of these roads are native ground, and not surfaced with aggregate material. These roads are likely to present opportunities for upgrade or decommissioning. (See Roads Analysis, Appendix D.)

In addition to the roads, a system of trails has been developed in the FEE area. These include hiking and horse trails. Unauthorized Off Highway Vehicle (OHV) trails have been identified as a source of erosion and sediment delivery to streams within the area. Poor location is the primary concern with these trails. Some mitigation work and decommissioning has begun to address the problems associated with these trails. Forest Development Trails (FDT) 56 and 57 were identified as examples of sediment sources and have been decommissioned. Trail #56 was closed in 1996 and #57 was closed in 2001.

Land use activities on private lands downstream from Forest Service ownership result in water quality impacts. Sediment sources are associated with farming, grazing, urban development and roads. These impacts have not been documented, however. None of the streams within the analysis area have been identified as being impaired by the State of Tennessee.

There is a great deal of literature documenting the natural erosion rates to be expected from undisturbed, forestland. This process is termed normal or geologic erosion, and represents the wearing away of land under conditions uninfluenced by human action. The geologic erosion rate results from the interplay of climate, topography, soil and vegetation. Hillside erosion in much of the undisturbed forest probably remained near zero for periods of a few to many years due to the hydrologic behavior exhibited by the undisturbed forest. It is likely, however, that on rare occasions erosion rates increased enormously when infrequent phenomenal rain saturated the soil, causing overland flow and debris avalanching. Less dramatic, but of equal and probably greater significance, was the recurrent rise and fall of water level in streams due to smaller floods that scoured various amounts of sediment from channels consistently throughout time. The major source of sediment in streams draining pristine forest usually is not hillsides, but the stream channel system. Close observation of many minimally disturbed experimental watersheds established rates of average annual sediment production on the order of 0.01 to 0.10 tons per acre per year (Patric, 1994).

Change from the "pristine" reference condition described above has resulted from human influence over thousands of years. Before the Euro-American settlement of the region, Indians had occupied, and influenced the landscape for thousands of years. This influence was limited, however, to agricultural-related alterations of the larger alluvial river valleys, primitive settlements in these valleys, and to the use of fire that affected uplands, as well as, riparian area.

Euro-American settlement in the late 1700's through the late 1800's was characterized by an agricultural subsistence economy similar to that which characterized the Indian lifestyle. The main difference was that agriculture and grazing extended beyond the larger river valleys to stream bottoms and coves at all elevations, slopes, and aspects (Bass, 1999). The combined effects of forest fallow farming, grazing, and uncontrolled use of fire resulted in near-universal soil erosion on much of the Southern Appalachian forest ecosystem (Ashe and Ayers, 1905 and Roosevelt, 1902). These activities and effects likely occurred on at least part of the area defined by this assessment.

Another significant Euro-American alteration that occurred to the forest ecosystem during this period was mining (Bass, 1999). Iron mines and smelters were established in east Tennessee from 1790 to about 1910. There is evidence of several of these mine sites within the FEE area.

During the time period from 1900 to 1930, commercial logging on a large scale occurred within the Southern Appalachians. Devastating wildfires often followed mass removal of the forest canopy. The combination of these activities along with grazing and farming resulted in highly accelerated rates of soil erosion. Commercial logging undoubtedly occurred during this time over most of the FEE area.

The Federal government acquired lands destined to become the Cherokee National Forest (CNF) in the early part of the 20<sup>th</sup> century. FEE area lands were purchased between 1922 and 1942. The lands were protected from fire, and allowed to rehabilitate. During this time, roads were constructed to provide access to the Forest and roads already in existence were improved. Vegetation management began with the first commercial timber sales occurring in the late 1960's. Forest Service system roads were constructed, if needed, to provide access to the sales. Several timber sales have occurred in the FEE area over the past 30 years.

Private lands in the lower watershed reaches of the FEE area have been utilized for a variety of purposes including farming, grazing, urban development, and forestry. Access roads have been constructed in support of these uses.

The human influences that have acted upon the FEE area have resulted in erosion rates higher than geologic reference rates, in the past. The range of natural variability associated with reference erosion rates is not known, however. Whether current erosion rates could be within the natural variability of the reference condition is not known. It is likely that roads and trails on Forest Service lands are producing erosion rates outside the reference natural variability. It is more likely that land uses on private lands within the FEE area are producing erosion rates outside of this range in variability.

The State of Tennessee has recently completed an initial assessment of the reference conditions of aquatic habitat, macro-invertebrate diversity, and water quality associated with the eco-regions of Tennessee. Two of these eco-regions are associated with the FEE area—Blue Ridge Mountains and Ridge and Valley. While only a starting point in determining reference condition, it is interesting to note the results of the water quality monitoring related to turbidity and suspended sediment for these two eco-regions (Table 2). Since samples were only taken on a quarterly basis during the years of sampling, it is doubtful these observations represent the natural range of variability for turbidity and sediment within the reference watersheds.

Table 2. Reference Data for Two Eco-regions in Tennessee

Eco-region	Turbidity			Suspended Residue		
	Mean	Minimum	Maximum	Mean	Minimum	Maximum
Ridge and Valley	6.2	65.0	0.2	6.1	5.0	38.0
Blue Ridge	1.5	15.0	0.1	5.5	5.0	49.0

## *Hydrology*

The FEE area is a small portion of the entire South Fork Holston River basin that is upstream from South Holston Lake. The area is about 46 square miles in size, while the basin size above South Holston Lake is 703 square miles. The flow of the South Fork Holston River downstream from South Holston Lake is completely regulated by the reservoir. A gage station was located below the South Holston Lake Dam from 1951 to 1973. During the period of record, the average discharge of the river was 938 cubic feet per second (cfs), while the maximum discharge was 8,270 cfs. Again, the discharge of this section of the river is completely regulated by the reservoir.

None of the streams within the FEE area have been gauged in the past. A few, miscellaneous, low-flow discharge measurements have been made in Hatcher Creek, Riddle Creek and Possum Creek in the past. In addition, low-flow measurements have been made in a stream (Indian Creek) adjacent to the analysis area. These measurements indicate that low-flows occur mainly during late summer and fall, and flow in these streams can be extremely low (less than 1 cfs) during these periods. The estimated average discharge in these streams is about 1.4 cfs per square mile of watershed.

Flooding of the South Fork Holston River near the FEE area is of minor concern since its flow is regulated below the South Holston Lake. The tributary streams within the area are subject to temporary flooding, but this is not known to have been a significant problem in the past.

The thrust belt and calcareous geology within this FEE area provides groundwater recharge for several nearby springs. Among these are Underwood Spring, Wildcat Spring(s), Webb Spring, Chalybeate Spring and Morrell Spring. Several of these springs are used for domestic and municipal water supplies. The recharge area for these springs is usually much larger than the surface watershed associated with them.

Reference hydrologic conditions in the FEE area would be reflective of a largely mature forest with minimal disturbance. Fires, wind or other natural disturbance would create gaps in the canopy, but these would likely be small and scattered in spatial and temporal scales. Peak flows and low flows would be attenuated by the conditions associated with a mature forest.

The present land use and the human-related disturbance history within the area have affected the yields and timing of flow within the FEE area watersheds. Following a period of exploitative logging during the early part of the 20<sup>th</sup> century, forest re-growth has occurred. The hydrologic condition of much of the FEE area has improved over the past 60 to 70 years. This is especially true on Forest Service ownership. Forest re-growth has led to a decrease in peak flows as timber has matured. Roads on national forest ownership will continue to slightly alter the hydrology of the area by extending drainage networks, and increasing quick-flow resulting from rain events. These effects can be ameliorated by mitigation designed to disconnect the roads from stream channels to the degree possible. Downstream, private land uses such as roads, farming and urban development will continue to alter hydrologic processes. Peak flows have been increased by these land uses, while the timing of flood events is generally quickened.

While the existing hydrologic condition of the FEE area is somewhat altered from the reference condition, any change in existing peak flow, low flow and the timing of these events from their reference condition is not considered to be of significant consequence. The Holston Reservoir regulates flows of the South Fork Holston River, downstream from the FEE area.

### *Stream Channel*

Valley types within this FEE area exhibit moderate relief, are generally stable, and have moderate side slope gradients. The upper reaches of streams can be described as A3 types by the use of the classification system developed by Rosgen. Stream gradients are generally steep in the upper reaches of the watershed (10%+) with low stream sinuosity. Channel materials are predominantly cobble with a mixture of boulders, gravel and sand. As the streams leave the Blue Ridge province and enter the Ridge and Valley lower in the watershed, stream gradients decrease, and the stream types generally change from an A3 to B3. Both of these stream types are generally stable.

Stream channels in the FEE area are, generally, in good physical condition. Roads and off-highway vehicle trails result in accelerated sediment deposition to some streams on national forest lands. In addition, impacts associated with downstream private land uses, likely result in significant amounts of sediment deposition into the lower reaches of the affected streams. There is very little evidence of active mass wastage within the FEE area, although it is quite likely to have occurred throughout geologic time.

Although not inventoried, it is possible that streams within the FEE area may be deficient in the types and sizes of large woody debris present historically. Stream channel condition in terms of large woody debris needs to be verified through field inventory.

Reference/desired stream channel condition within the FEE area is similar to the existing condition. Desired morphological characteristics of the streams would be generally stable A and B stream types with low sediment supply. Bed features would normally be described as rapids with interspersed scour pools. Channels would be dominated by gravel, cobble and boulder substrate. Large woody debris would be plentiful within the stream channel.

### *Water Quality*

No known water quality data has been collected in the streams within this FEE area, except for basic information taken during fish surveys (see *aquatic ecosystems*). Tennessee Valley Authority (TVA) and United States Geological Survey (USGS) have collected data in the main stem of the South Fork Holston River and South Holston Lake, but this data represents conditions in the 703 square mile watershed above the lake, or an even larger watershed area for sites below the dam. Average values for water quality characteristics measured by TVA during calendar year 1999 include water temperature (16.9 °C), dissolved oxygen (9.8 mg/l), pH (8.7 std. units), hardness (116 mg/l), total suspended solids (4.2 mg/l), conductivity (329 micro-ohms/cm), and total dissolved solids (200 mg/l). These

measurements were made many miles downstream from the FEE area. These measured values are within applicable state water quality standards.

The State of Tennessee has classified the South Fork Holston River from River Mile 5.7 to the Virginia state line as domestic and industrial water supply. In addition, the recharge area for the water supply of Bluff City (Underwood Spring) and Chiquapin Grove (Wildcat Spring) is located within this analysis area. Another stream in the FEE area, Big Creek, is classified as a trout stream. As part of the source area for the South Fork Holston River and the recharge area for Underwood and Wildcat Springs, water quality is critical. Suspended sediment is a key water quality parameter in meeting these uses. While visual evidence indicates that suspended sediment concentrations are generally low in these water bodies on national forest lands, it can be problematic during periods of intense rainfall. Roads and illegal OHV trails are believed to be the primary source area for the suspended sediment. While not documented, it is likely that suspended sediment concentrations and deposition are more problematic downstream as the impact of private land use affects these water bodies.

Reference conditions for water quality are not documented within the specific FEE area. The Tennessee Eco-region Project has completed an initial effort to establish reference conditions for water quality by eco-region. Although none of the eco-region reference sites were located within the FEE area, several of the selected sites were located on national forest lands within the eco-regions. A summary of water quality statistics for each eco-region represented in the FEE area (Blue Ridge and Ridge and Valley) is displayed in Tables 3 and 4 below. The data values and statistics shown represent sites within the entire eco-region, and provide a first approximation of reference water quality.

The desired condition for water quality within the FEE area is to meet the designated use criteria for the streams and other water bodies. At the present time, all water bodies are meeting their designated use. No impaired waters are listed within this FEE area.

Table 3. Descriptive Statistics of Water Quality Data for Blue Ridge Eco-region

Parameter	Unit	# Observations	Minimum	Maximum	Median	Mean
Temp	° C	153	1.01	24.72	11.60	11.67
DO	Mg/l	152	7.74	16.60	10.06	10.31
Ph	SU	149	3.61	9.230	7.24	7.28
Sp Cond	umho	150	9.00	145.00	27.00	33.85
Sus Res	Mg/l	164	5.00	49.00	5.00	5.51
Diss Res	Mg/l	164	5.00	126.00	22.00	26.96
Turbidity	NTU	163	0.10	15.00	0.90	1.50
Tot Alk	Mg/l	162	3.00	108.00	8.00	13.16
Tot Hrd	Mg/l	164	0.50	211.00	12.00	17.32
Amn N	Mg/l	164	0.01	0.12	0.01	0.01
NO2/3	Mg/l	164	0.005	1.47	0.16	0.17
Tot N	Mg/l	160	0.05	0.24	0.05	0.055
Tot Phos	Mg/l	163	0.002	0.40	0.005	0.01
Arsenic	Ug/l	157	0.50	1.00	0.50	0.51
Cadmium	Ug/l	158	0.50	0.50	0.50	0.500
Tot Chrom	Ug/l	154	0.50	4.00	0.50	0.53
Copper	Ug/l	137	0.50	12.00	0.50	0.94
Iron	Ug/l	153	12.50	944.00	50.00	95.12
Lead	Ug/l	155	0.50	1.00	0.500	0.51
Manganese	Ug/l	153	2.50	63.00	5.00	7.74
Zinc	Ug/l	164	0.50	34.00	2.00	3.69
Fec Col	/100 ml	160	0.0	8400.00	8.00	122.6*
E Coli	/100 ml	58	0.0	40.00	0.00	5.7**

\* Geometric Mean for fecal coliform is 3.6.

\*\*Geometric mean for e.coli is 0.2

Table 4. Descriptive Statistics of Water Quality Data for Ridge and Valley Eco-region

Parameter	Unit	# Observations	Minimum	Maximum	Median	Mean
Temp	° C	126	3.00	24.26	9.89	11.63
DO	Mg/l	126	5.56	15.42	10.71	10.64
Ph	SU	124	4.75	8.89	8.00	7.94
Sp Cond	umho	121	32.50	699.00	251.00	275.45
Sus Res	Mg/l	129	5.00	38.00	5.00	6.12
Diss Res	Mg/l	124	15.00	409.00	157.50	168.46
Turbidity	NTU	127	0.20	65.00	4.00	6.23
Tot Hrd	Mg/l	130	10.00	899.40	164.50	176.17
Amn N	Mg/l	130	0.01	0.060	0.010	0.012
Tot Alk	Mg/l	129	1.00	236.00	140.00	132.43
NO2/3	Mg/l	130	0.005	2.27	0.525	0.610
Tot N	Mg/l	129	0.05	1.00	0.05	0.087
Tot Phos	Mg/l	130	0.002	3.00	0.008	0.047
Arsenic	Ug/l	125	0.50	1.00	0.50	0.508
Cadmium	Ug/l	130	0.50	0.50	0.50	0.500
Tot Chrom	Ug/l	120	0.50	4.00	0.50	0.554
Copper	Ug/l	107	0.50	11.00	0.50	1.78
Iron	Ug/l	124	12.50	2300.00	114.00	222.68
Lead	Ug/l	119	0.50	1.00	0.500	0.508
Manganese	Ug/l	124	2.50	104.00	14.00	19.89
Zinc	Ug/l	129	0.50	158.00	4.00	6.20
Fec Col	/100 ml	130	0.0	6700.00	132.00	452.4*
E Coli	/100 ml	57	0.0	2419.00	82.00	222.0**

\*Geometric mean for fecal coliform is 107.2

\*\*Geometric mean for e.coli is 32.0

Each of the existing condition elements described above have a reference condition that represents sustainable and healthy natural processes, structures, and components. There is no single data point reference condition for the elements, however, but rather a range of natural condition that reflects the inherent variability of the elements. These reference conditions are not well known. Very little monitoring and evaluation has been done to verify whether the elements are within the range of variability, even if the reference condition was known.

## Biological Elements

### *Aquatic Ecosystems*

Streams within the FEE area drain into the South Holston River System. Most begin as small headwaters on Forest Service land and reach greater size lower on private land. Most of the streams flow into the South Holston River, but a few flow directly into South Holston Lake. The riparian corridors along the streams on private land vary from forested to residential to agricultural. The riparian corridors on Forest Service land are primarily forested.

Table 5. Streams of the Flatwoods Ecosystem

Watershed	Stream	Reach	Order
Indian Creek/SH River	Licklog Branch	1	2
Indian Creek/SH River	Big Arm Branch	1	3
Dry Creek/SH River	Sigman Hollow	2	1-2
Dry Creek/SH River	Underwood Spring Branch	1	2
Possum Creek/SH River	Miller Branch	1	1
Possum Creek/SH River	Weaver Creek	1	2
Possum Creek/SH River	Cold Spring Branch	1	1-2
Possum Creek/SH River	Berry Branch	1	2
Hatcher Creek/SH River	Right Prong Hatcher Creek	1	3
Hatcher Creek/SH River	Little Branch	1	2
Hatcher Creek/SH River	Hatcher Creek	1	1
Morrell Creek/SH River	Morrell Creek	1	3
Riddle Creek/SH Lake	Riddle Creek	1	2-3
Riddle Creek/SH Lake	Roaring Fork	2	3
Riddle Creek/SH Lake	Little Creek	1&2	2
Big Creek/SH Lake	Big Creek	1	3-4
Big Creek/SH Lake	Left Prong Big Creek	1	3

### Streams

Many of the streams in the FEE area have been surveyed for fish communities. The latest sample dates and species are listed in Table 6. Some sections have been surveyed in other years. Licklog Branch, Sigman Hollow, Underwood Spring Branch, Weaver Creek, and Berry Branch were not surveyed because they are too small to support fish. Big Arm Branch was completely dry in 1999 due to drought conditions. Surveys were conducted with one pass using a backpack electroshocker.

Streams at lower elevations below Forest Service ownership likely support coolwater communities including rock bass, smallmouth bass, and bluegill with a variety of minnows and darters. Some streams on private land support populations of rainbow trout. TVA assessed Indian Creek and Possum Creek in 1993 using an Index of Biotic Integrity (IBI) and a macroinvertebrate survey (EPT). Indian Creek had a poor (30) IBI score and a fair (9) EPT. Possum Creek had a fair (40) IBI score and a poor/fair (6) EPT (TVA 1996). The majority of the streams on Forest Service land support coldwater fish communities dominated by rainbow trout or small headwaters with only blacknose dace.

**Table 6. Fish Species in the Streams of the Flatwoods Ecosystem**

Species	CSB	MB	BC	LP BC	LC	MC	RC	HC	RP HC	RF
Bluegill					X					
Rainbow Trout			X		X	X			X	X
Brown Trout			X							
Mottled Sculpin										X
Logperch			X							
Fantail Darter	X		X		X					X
Bluntnose Minnow					X					
Creek Chub			X	X						X
Blacknose Dace	X	X	X	X	X	X	X	X	X	X
<b>Last Survey</b>	93	93	99	99	99	99	99	93	99	99

CSB – Cold Springs Branch, MB – Miller Branch, BC – Big Creek, LPBC – Left Prong Big Creek, LC – Little Creek, MC – Morrell Creek, RC – Riddle Creek, HC – Hatcher Creek, RPHC – Right Prong Hatcher Creek, RF – Roaring Fork

Trout populations in Big Creek, Little Creek, Morrell Creek, Right Prong Hatcher Creek, and Roaring Fork Creek are very sparse. These streams are mostly limited by marginal habitat and water temperature. Other limiting factors could be available food sources due to the infertile waters characteristic of southern Appalachian streams (Strange 1998) and the sporadic and fairly low amount of large woody debris.

No Threatened or Endangered aquatic species occur in the streams of the Flatwoods system. Tennessee dace, a Sensitive species, occurs in one of the small streams in the area.

#### South Holston River

South Holston River was once a diverse warmwater ecosystem inhabited by many now rare species. After construction of South Holston Dam in 1951, many species were lost due to severe alteration of habitat. The tan riffleshell once lived in the riffles and shoals near the Flatwoods system. Now this species is only known from the Clinch and Hiwassee Rivers (Parmalee 1998). The U.S. Fish and Wildlife Service currently lists it as Endangered. The spotfin chub (turquoise shiner), currently listed as Threatened by the U.S. Fish and Wildlife Service also once occurred here, but is now gone. The blotchside logperch, longhead darter, and duskytail darter lost their habitat and are no longer found in the South Holston River. The sharphead darter is now gone from the South Holston in Tennessee, but a population still exists upstream of the reservoir in Virginia (Etnier 1993). The latter four species are now listed on the Regional Forester's Sensitive Species list.

A trout tailwater fishery is now established on the South Fork of the Holston River below the South Holston Dam. Historically, discharges from South Holston Dam experienced a period of low dissolved oxygen (DO) during summer and fall. To address this concern and a lack of minimum flow in the tailwater, TVA constructed an aerating labyrinth weir in 1991. The weir and improvements to the turbine combine to help maintain higher DO levels and minimum flow (Habera et al. 1999).

The tailwater has been managed as a put-and-take and put-grow-and-take trout fishery with annual stockings of both catchable and fingerling rainbow and brown trout. It was first stocked in 1952 with rainbow and brook trout fingerlings and adults. Recent investigations have documented an abundance of large fish and substantial natural reproduction, especially by brown trout (Habera et al. 1999). This tailwater is now recognized nationwide as one of the best trout tailwaters in the Southeast and the entire United States (Bettoli et al. 1999).

#### South Holston Reservoir

This reservoir supports a warmwater community including bass, bluegill, catfish, crappie, walleye, and sauger. According to TVA's ecological health rating, South Holston Reservoir rates fair to poor due to low DO levels, high chlorophyll levels, and little bottom life. The fish community rated fair and sediment levels were fair to good (TVA 2001).

In spite of this, South Holston Lake is fast becoming known as one of the best smallmouth lakes in the state. The lake has the excellent habitat to support a good population of smallmouth bass. The average sport-fishing index for the Tennessee Valley is 30 for smallmouth, and South Holston reservoir rated a 55 in 2000 (TVA 2001). The sport fishing indexes for largemouth bass and walleye/sauger were also above average. The ratings for crappie, channel catfish, and bluegill were below average.

#### *Vegetation*

Forested Stands in the FEE area exhibit age class distributions typical of the CNF (Continuing Inventory of Stand Conditions (CISC) database, 2001). A high percentage (65%) of stands fall within the 71-100 year old age class. There is considerable acreage in younger age classes because of previous management activities. There is also acreage in the 100-150+ year age classes (Figure 1). These stands in most cases were inaccessible to the large-scale logging that occurred over much of the Appalachians in the early 1900's.

Approximately nine percent of the area is in age classes older than 100 years, and about three percent is in stands in the 0-10 year age class. Much of this is in the upper end of this class, and will soon enter the 11-20 year age class.

Twenty-three Forest Types are represented (CISC database, 2001). Seventy-eight percent of the area is in only four types: Forest Type 45 (Chestnut Oak-Scarlet Oak-Yellow Pine), Type 53 (White Oak-Northern Red Oak-Hickory), Type 56 (Yellow Poplar-White Oak-Northern Red Oak), and Type 60 (Chestnut Oak-Scarlet Oak)(Figure 2)

## AGE CLASS DISTRIBUTION

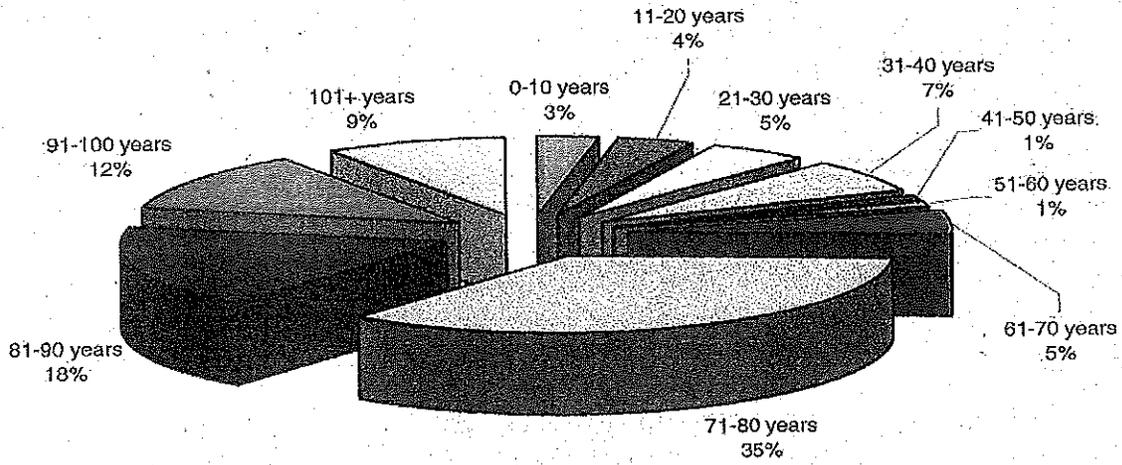


Figure 1

## FOREST TYPES

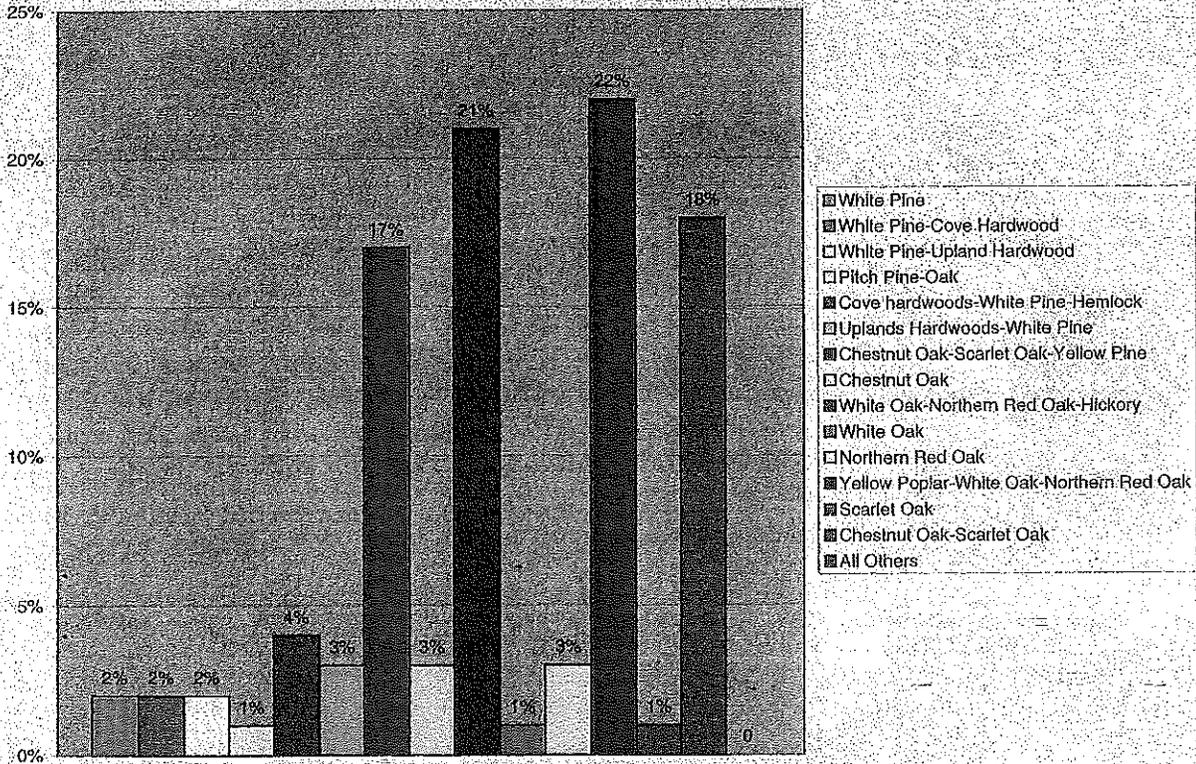


Figure 2

The confidence level of stand ages is highest in the younger stands, in those areas where management has occurred, and the more readily accessible areas. Most of these stands have been aged by taking increment cores or the actual regeneration date is known. Many of the stands in the higher reaches and more inaccessible areas may have born-on dates recorded in CISC that were presumed at the time these compartments were first entered into the CISC database. At that time the exact age did not seem critical. The precise born-on dates of these stands should be verified by increment borings.

Pines comprise greater than 30% of the dominant and co-dominant crowns in 13 Forest Types on approximately 30% of the area. The ongoing Southern Pine Beetle outbreak is rapidly killing Yellow Pines, White Pines, and now Hemlocks, all through the FEE area. The loss of this softwood component will move these stands into Forest Types composed of mostly hardwoods, in the absence of significant disturbance to regenerate softwoods. The current CISC data does not reflect the loss of the pine component in the pine types and pine-hardwood mix types, because this is recent and still ongoing.

An ecosystem would have the most resistance to environmental calamities such as storm events, insect and disease outbreaks, or severe wildfire; if the forest consisted of a wide diversity of age classes, Forest Types and condition classes. In that situation, it would be less likely for any disruption to affect an overly large proportion of the area, and recovery would be faster. The FEE area has a large proportion of the Forest in only four Forest Types, and the age classes cluster around 70 to 100 years of age. These stands are becoming increasingly susceptible to damage from environmental agents.

#### Rare Communities

Several rare and unique communities are known to occur within the FEE area. Underwood Spring, Big Wildcat Spring, Little Wildcat Spring, Webb Spring, Chalybeate Spring and numerous seeps provide habitats for wetland communities. Rock outcroppings are present at Flint Rock (just outside the FEE area), Underwood Spring, and at several locations on the upper slopes of Holston Mountain. Boulder fields are present at numerous sites between 2600 and 2800 feet MSL. Karst topography, including sinkholes and caves, are present on private land, but no caves or sinkholes have currently been documented on Forest Service land. Additional survey work in the area is needed to identify other rare and unique communities. Additional research is needed in these areas to identify significant features so that proper management techniques can be developed to conserve these areas. Opportunities include inventory, monitoring, acquisition, working with private landowners, education and interpretation, and development of site-specific management plans where applicable. The biggest threat to rare communities recently has been vehicle use in the Underwood Spring area. Management to control access in this area has been implemented.

#### Rare Plants

The FEE area has rich plant diversity with many occurrences of rare species. Based upon known site data recorded from the Tennessee Natural Heritage (NH) Program (Tenn. Dept. of Cons. 2001) and Cherokee National Forest Threatened (T), Endangered (E), and Sensitive (S) database (Cherokee

National Forest 2001), the following 14 rare species are known to occur on private and Forest Service lands within the FEE area.

Table 7. Rare Plants of the Flatwoods Ecosystem Area

Scientific Name	Common Name	Status
<i>Buckleya distichophylla</i>	Piratebush	S
<i>Dryopteris cristata</i>	Crested Shield Fern	NH
<i>Eupatorium steelii</i>	Steele's Joe-pye-weed	NH
<i>Gentiana austromontana</i>	Appalachian Gentian	S
<i>Juglans cinerea</i>	Butternut	S
<i>Panax quinquefolius</i>	American Ginseng	NH
<i>Platanthera flava var. herbiola</i>	Tubercled Rein-orchid	NH
<i>Platanthera orbiculata</i>	Large Round-leaved Orchid	NH
<i>Prenanthes roanensis</i>	Roan Mountain Rattlesnake Root	S
<i>Pyrola Americana</i>	Shinleaf or American Wintergreen	NH
<i>Symplcarpus foetidus</i>	Skunk Cabbage	NH
<i>Trientalis borealis</i>	Northern Starflower	NH

Six of these species (*Eupatorium steelii*, *Gentiana austromontana*, *Juglans cinerea*, *Platanthera orbiculata*, *Prenanthes roanensis*, *Pyrola rotundifolia*, and *Trientalis borealis*) have been encountered during recent botanical investigations (McGuinness 2000, McGuinness 2000a, and TES database). Several other rare plant species have been documented in adjacent areas or are in need of confirmation.

Table 8. Rare Plants in Adjacent areas or in Need of Confirmation

Scientific Name	Common Name	Status	Documented or Need Confirmation
<i>Cardamine rotundifolia</i>	Round-leaved Bittercress	NH	Needs Confirmation
<i>Cymophyllus fraserianus</i>	Fraser's Sedge	NH	Documented
<i>Listera smallii</i>	Kidney-leaved Twayblade	NH	Needs Confirmation
<i>Tsuga caroliniana</i>	Carolina Hemlock	S	Documented

Habitat for these and other rare species is present within the watershed. Additional botanical work in the area is likely to locate several of these species within the watershed and add additional records for species already known. Monitoring these occurrences and revisiting sites that have not been checked in the past 15 years is strongly encouraged.

## Non-native Plants

Many non-native plants species are known to occur in the FEE. Many of these are associated with old railroad and mining areas, power and road right-of ways, and forest edges. These include daffodils, apples, and hybrid poplars. These plants do not appear to spread to any degree. Other plants such as Crown vetch and Sericea lespedeza were most likely planted for erosion control and continue to persist along open roadways, power lines, and wildlife openings.

Many other non-native or exotic plants have spread aggressively. These invasive exotic plants have the potential to, or already have displaced many native species and their habitats in the FEE area. Japanese stilt grass (*Microstegium vimineum*) and Japanese honeysuckle (*Lonicera japonica*) are consistently found throughout the area. Multiflora rose (*Rosa multiflora*), Privet (*Ligustrum sinense*), Paulownia (*Paulownia tomentosa*), and Japanese knotweed (*Polygonum cuspidatum*) are also commonly encountered within suitable habitat. Because invasive exotics are often widespread, it is important to identify priority areas for treatment and management. Such areas might include sensitive habitats such as wetlands and riparian areas, and unique sites such as known rare species locations. The Tennessee Exotic Pest Plant Manual (1996) and other sources should be consulted to determine the best method of treatment.

## Wildlife

The FEE area provides habitat for a wide variety of wildlife species. This diversity is associated with several environmental factors including: 1) elevations ranging from 1,500 to 4,300 feet MSL (USGS topographic maps), 2) its geographic position on the edge of the Ridge and Valley and Blue Ridge provinces, 3) varied topography and aspects that provide both moist and dry conditions for many different forest types, and 4) forests ranging from two to over 140 years of age (Cherokee National Forest CISC database 2001). These habitat conditions have varied throughout time. From a predominately forested landscape prior to European settlement, to a mostly open landscape following logging and mining activities in the early 1900's. Following the logging and mining era, the FEE area has gradually succeeded to the forested landscape that is present today. With the exception of the construction of South Holston Dam that created South Holston Lake in 1950, few notable changes have taken place within the ecosystem area. Wildlife populations have fluctuated over time as the dominant habitat conditions gradually changed from early successional to late successional forest. This has resulted in population increases and decreases, movements into and out of the area, and is responsible for the array of wildlife species present today within the FEE area.

Historically, wildlife conditions within the FEE area followed the same scenario as other places in the southern Appalachians. Elk, timber wolf, cougar, bear, and beaver were plentiful in the area prior to European settlement, but these species and others suffered significant population declines or were eliminated by the early 1900's through habitat loss and hunting. The chestnut blight and logging and mining activities followed, further altering habitat conditions in the area. By the late 1920's, much of the forest had been removed resulting in drastic changes in wildlife populations. Forest cover began to increase in the area during the 1930's and 40's, but even by the 1950's seeing a turkey or deer was a rare event.

The completion of South Holston Dam in 1950 (TVA) had several impacts on wildlife in the area. Most notable was the loss of approximately 7,000 acres of terrestrial habitat. This includes several hundred acres of floodplain forest, a habitat that is uncommon on the CNF. The lake also serves as a semi-permeable boundary to wildlife movements, separating the forest-dominated landscape to the east from the agriculturally dominated landscape to the west along its 24-mile length. Some other impacts are less notable. For example, the lake has increased moisture regimes that is resulting in a gradual change in forest conditions within some stands. Stands with an overstory of chestnut oak, black gum and yellow pine now harbor northern red oak, yellow-poplar, and white pine in the understory. As these stands mature, the more mesic species in the understory will begin to dominate these stands resulting in a change in forest type. This will result in a gradual change in wildlife species within these stands. Similar changes should be expected within pine dominated stands recently impacted by the Southern pine beetle outbreak.

By the 1970's and 1980's, the FEE area was dominated by maturing forest interspersed by young stands regenerated through slashdown and timber harvest. Food availability was increasing as acorn and nut production began to increase. Regenerating stands, power line right-of-ways, and wildlife openings created by seeding log landings and logging roads continued to provide abundant fruits, seeds, and early spring forage that ensured a continuous food source throughout the year. Management efforts by the Tennessee Wildlife Resources Agency (TWRA), the Forest Service, and conservation groups resulted in successful reintroduction, or habitat improvements for deer, turkey, bear, and grouse. These actions along with natural recovery processes resulted in a considerable increase in habitat diversity when compared to conditions in the early 1900's, which allowed many wildlife species to increase.

From 1991-1993, the CNF, TWRA, Tennessee Technological University, Bristol Herald Courier and many local organizations and sponsor's worked cooperatively to release 29 young Bald Eagles in the hopes that one day our national symbol would nest on South Holston Lake. Since their release, surveys to monitor eagle activity have been conducted by TWRA (TWRA 2001) and the CNF (McGuinness 1994-2001). Midwinter survey results (TWRA 2001) increased from a previous high of one to five eagles in 1995 and has varied between one and three eagles from 1997-2001. Eagles have now been observed in every month of the year, but breeding has not yet been confirmed on South Holston Lake.

Forest Service ownership within the FEE area is contiguous at the higher elevations, but very uneven at the lower elevations. Several out-holdings and fingers of ownership marked the irregular boundary with private land. Private lands immediately adjacent to Forest Service ownership are primarily forested, but some pastures, fields, marinas, and homes are also present. Pastures and fields dominate private ownership as you move westward toward the Holston River and the communities of Hickory Tree and Chinquapin Grove. Management direction for wildlife in the area under the current Cherokee National Forest Land and Resource Management Plan (FLRMP) (USDA Forest Service 1996) is to emphasize both late and early successional species. Late successional species are emphasized within Compartments 105-111, and 117. Early successional species are emphasized within Compartments 112-115.

Compartments 105-111 and 117 comprise 65.5% (8,494 acres) of the FEE area and are managed for late successional species such as the pileated woodpecker and gray squirrel (Cherokee National Forest CISC

database 2001). Furthermore, Compartments 105-110 have been designated bear significant; meaning that special emphasis is given to providing productive black bear habitat within this region. In order to meet the diverse needs of wildlife in the area with an emphasis on late successional species, the following standards and guidelines from the FLRMP have been established:

1. Average mast capability would be at least 83 pounds/acre.
2. Maintain at least 64% of each compartment or cluster in the 31+ age class for den tree production.
3. Maintain at least 4% of cove or upland hardwood forest in the 91+ age class.
4. Where bears exist, maintain at least 5% of cove and upland hardwood forest that are capable of providing bear denning trees in the 91+ age class.
5. Maintain at least 50% of each compartment in stands greater than 20 years old and that do not have an understory of Mountain laurel or moist heath and rhododendron.
6. Maintain dens and snags in intermediate cuts according to Forest Service Manual (FSM) 2631, Supplement 36.
7. Direct habitat management would be done using general direction of the Wildlife Habitat Management Handbook, Forest Service Handbook (FSH) 2609.23R.
8. Distribute regeneration cuts so that no more than 15% and no less than 6% of each compartment or cluster is in the 0-10 year age class.
9. Being bear significant, all new roads will be closed and consideration may be given to closing existing open roads in order to achieve an open road density of 0.5 miles per square mile.
10. Being bear significant, 5% of cove and upland hardwood forest that are capable of providing bear denning trees will be designate as land class code 829 and managed for old growth.

Currently, all standards and guidelines are being met with the exception of the open road density (between 0.65 and 0.71 miles) and 0-10 year age class requirements (currently one percent of all forested lands). However, the average mast capability could benefit from some management as oak decline and Gypsy moth pose a threat to future mast output in the area (John Gent 1994, James Rhea 1994, Stephen Oak and Philip Croll 1995). An additional 32 acres of bear denning habitat also needs to be designated within Compartment 106 in order to comply with bear significant standards and guidelines.

Compartment 112-115 comprise 34.5% (4,471 acres) of the FEE area and are managed for early successional species such as the White-tailed deer and Yellow-breasted chat (Cherokee National Forest CISC database 2001). In order to meet the diverse needs of wildlife in the area with an emphasis on early successional species, the following standards and guidelines have been established:

1. Average mast capability would be at least 83 pounds/acre.
2. Maintain at least 41% of each compartment or cluster in the 31+ year age class for den tree production.
3. Maintain at least 25% of each compartment in stands greater than 20 years old and that do not have an understory of Mountain laurel or moist heath and rhododendron.
4. Maintain dens and snags in intermediate cuts according to FSM 2631, Supplement 36.

5. Direct habitat management would be done using general direction of the Wildlife Habitat Management Handbook.
6. Where possible, distribute regeneration cuts so that at least 11% of each compartment or cluster is in the 0-10 year age class.

Currently, all standards and guidelines are being met with the exception of the 0-10 year age class requirements (currently three percent of all forested lands). The current availability of early successional habitat is consistent with availability over the past 30 years. This falls well short of management area standards and guidelines. In fact, this level of 0-10 year age class habitat does not even meet the requirements for areas managed for late successional species. The Forest Service needs to evaluate this situation and either commit to creating early successional habitat to meet existing standards and guidelines, or change the management emphasis to late successional species.

Analysis within the FEE area consisted of field reconnaissance; bird surveys (McGuinness 1996-2001, McGuinness 1998, McGuinness 2000b, McGuinness 2001a-c) small mammal trapping (Norris), salamander (McDonald 1999, McDonald 2001) and butterfly work (Nagel 2001) within and immediately adjacent to the area; a review of existing information (CISC database, TES database, TWRA 1999) and information gathered at the public meeting (May 10, 2001; Open House at Jacobs Creek Job Corps Center). Based upon the available information, the following discussion of the existing conditions affecting wildlife was developed.

1. *Age class diversity.* Within Forest Service ownership, 66% (8,547 acres) of the forested lands are in the 71-80, 81-90, and 91-100 year age classes (Cherokee National Forest CISC database 2001). These three age classes comprise 35%, 18%, and 13 % of the total forested acreage respectively. No other ten-year age class comprises more than seven percent of the total acreage. Having such a clumped age class distribution presents a forest health concern and provides little habitat for wildlife species that prefer young, intermediate, or old growth conditions. Soft mast availability, early spring forage, and brooding habitat can become limiting due to a lack of young and intermediate stands. Large denning habitat for bears, and large woody debris for insects, salamanders, and other animals are also in short supply within the area due to a lack of older stands. Managing to produce a more balanced age class distribution would increase the overall diversity in the area and better meet wildlife needs. Opportunities to improve overall age class diversity would include minimizing regeneration in stands greater than 100 years of age; manage the recharge area of the Bluff City water supply for old growth; using timber harvest, slashdown, and stand replacement fires to reduce the acreage within the 71-100 year age classes through regeneration; clearing some areas to create permanently managed early successional habitat; and altering stand age through timber stand improvement or selective harvest.
2. *Availability of early successional habitat.* Stands in the 0-10 year age class hit a post-logging high of 960 acres during the 1960's and has steadily declined to the 300 acres that are available today. This represents only four percent of the suitable lands within the FEE area. This does not meet the minimum 0-10 year age class requirements of six percent for late successional species. With 4,471 acres of the FEE area managed for early successional species and an 11% minimum 0-10 requirement, it would require at least 492 acres of additional early successional

habitat in order to meet FLRMP goals and objectives. Early successional habitat can be created in a multitude of ways. This includes setting back existing 0-10 year old stands through burning, slashdown, or herbicides and maintaining them in this age class; creating new 0-10 year old stands by setting back 11-30 year old stands through similar actions; creating new seedling/sapling habitat in older stands through timber harvest, slashdown, injection, or stand replacement fires, and allowing existing wildlife openings to succeed into a shrub and sapling stage. The Forest should strive to meet and maintain minimum early successional habitat requirements in order to meet the needs of early successional species in the area.

3. *Availability of hard and soft mast in the area.* Although hard and soft mast can be found throughout the FEE area, there are few areas where they are in large supply. Soft mast is plentiful in the early successional habitat that is available, but is limited within older stands due to canopy cover, forest composition, and competition from Mountain laurel and rhododendron. Recent understory burns have provided some increases in soft mast production, but additional work is needed. Other opportunities to increase soft mast production include releasing and maintaining soft mast plantings in wildlife openings; increasing light reaching the forest floor through silvicultural treatments (timber stand improvement, single tree selection, injection) or burning; creating additional early successional habitat, and planting additional soft mast producing species. Hard mast is mostly provided by oaks, but hickories, beech, walnut, and occasionally an American chestnut also produce this valuable food source for wildlife. These species are present within the young and intermediate stands, but at lower densities than currently occur in the mature overstory. As these stands continue to mature, hard mast production will slowly begin to decrease. This decrease will be accelerated within stands with oak decline or when the Gypsy moth reaches the area. Several management techniques could be used to increase future hard mast production in the area. These include releasing hard mast producing trees from competition to increase survival; conducting midstory treatments prior to harvest to promote advanced oak regeneration; utilizing fire to reduce competition from non-fire tolerant species; planting mast producing species; and leaving mast producing trees when daylighting wildlife openings and as leave trees in shelterwood areas.
4. *Water availability.* Within the FEE area, many springs and streams go dry or flow underground during late summer and fall. This is especially apparent in the rocky soils present between 2200 and 2800 feet MSL. This lowers habitat suitability in areas where water is absent and results in concentrating wildlife near reliable water sources, or repeated short distance movements by animals in order to obtain water. Providing reliable water sources would improve habitat suitability where water is limiting. Establishing wildlife water holes, ponds, or bringing some of the subsurface flow back above ground (pipe to small pool or move surface rocks to expose small area of subsurface flow) are all potential management practices to increase water availability in the area.
5. *Black bear habitat.* All of the FEE area contains suitable habitat for black bear, but only Compartments 105-110 have been designated as bear significant in the current FLRMP (USDA Forest Service 1986). Two of the current standards and guidelines, open road density and 0-10 year age class requirements, are not being met at this time. Although designation requirements for bear denning habitat (land class code 829) have been met within the six-compartment

cluster, these requirements have not been met within Compartment 106. Efforts to meet these standards and guidelines should be undertaken to provide for the diverse habitat needs of black bear in the area. Other activities that would help maintain suitable Black bear habitat include continuing to provide habitat diversity, conduct black bear surveys to monitor population changes, and monitoring visitor use and bear activity so that any negative trends can be identified.

6. *Presence and management of rare wildlife species.* Current inventory and research activities in the area have documented the presence of two CNF Threatened, Endangered, and Sensitive species: bald eagle and Diana fritillary butterfly. Several other State listed species including the sharp-shinned hawk, and common raven, southeastern shrew, southern bog lemming, whip-poor-will, brown creeper, black-billed cuckoo, least flycatcher, and blackburnian warbler have also been documented in the area. Given the present habitat diversity in the area, additional species such as the Appalachian Cottontail, Least weasel, and Gray bat are likely to occur in the area. Additional inventories should be encouraged in the area. Monitoring and management of rare species should be a priority in order to increase the available knowledge in the area. Reintroduction of some rare species should be considered where suitable habitat is present.
7. *Wildlife viewing opportunities.* The FEE area has several open roads and trails, but little has been done to provide wildlife viewing opportunities to forest users. Some hunting trails exist and nest boxes in wildlife openings increase opportunities for viewing wildlife. Opportunities exist for wildlife interpretation, viewing blinds, establishing nature trails and hunting trails, providing more nest boxes and favorite foods to attract wildlife, and conducting hikes.
8. *Out holdings.* National Forest ownership includes three out holdings in the FEE area. These lands have no public access, which restricts opportunities for management. The out holdings should be evaluated to determine their significance (rare species or unique habitats) and need for management. If significant resources are found, then efforts to obtain access and linking these properties to other Forest Service lands should be pursued. If significant features are not found, then these properties should be considered for land exchange in order to acquire private land that is contiguous to Forest Service boundaries. Consolidating Forest Service boundaries would help deter some of the illegal access problems, which are having negative effects on wildlife.
9. *Illegal access and dumping.* Illegal access is a problem within the FEE area. Illegal trails, hill climbing, traveling around or tearing down gates to gain access to closed roads, tearing out water bars, illegal dumping, and driving through wildlife openings are all activities that take place within the area. These actions result in environmental damage, increase poaching opportunities, and decrease habitat suitability for wildlife in the area. Actions should be taken to close existing illegal roads and trails, remove illegally dumped materials, and deter these practices in the future.

## **Disturbance Regimes**

Ecosystems are dynamic and change over time, sometimes gradually and sometimes catastrophically. Disturbances initiate these changes. Disturbances vary in size, in duration, and in intensity. The death of single trees in a forested ecosystem allows for regeneration and release of understory species over a few percent of area in any given year. Major windstorms may blow over hundreds of acres, but usually occur infrequently.

### *Past elements of change*

Disturbances to an ecosystem are either natural or caused by humans. Human disturbances can be divided into those taking place before European settlement and after European settlement of North America (see Bass, 2002). Lightning fires, windstorms, ice and snow, landslides, droughts and floods, frost damage, animals, insects, and disease have all been natural agents of change in the FEE area.

Humans have been part of the ecosystem for over 10,000 years. Native Americans used this area for hunting, food gathering, and homesites. Native Americans utilized fire for vegetation management, but the extent of that effect on this area is unknown.

Effects of humans on the FEE area greatly accelerated after European settlement. Fire use increased to clear land for agriculture and pasture. Large scale industrial logging in this area was done prior to Government purchase of these lands in the 1920's. Early management of the area by the Forest Service was primarily protective, including fire suppression, to allow these lands to reforest.

American Chestnut, which once was a major component of forest stands, was virtually eliminated by the introduced Chestnut Blight during the 1950's. Occasional stump-sprouts are all that remain of this once dominant species.

South Holston Dam was constructed in 1951. The resulting reservoir has changed local weather patterns, vegetation patterns, wildlife use, and human activities.

Electronic sites on Holston Mountain were established beginning about 1956, and Low Gap Recreation Area was constructed in 1959. Portions of these facilities are on the FEE side of Holston Mountain, although access to these sites is via FDR #56 and FDR #202, on the other side. Other Powerlines and Special Uses have been established in the FEE area. See "Special Uses, Lands, Facilities" under Social and Cultural Elements.

Forest Service timber management began in the FEE area in the mid-1960's, with major timber sales in every decade since. Early harvest was largely by the clearcut method. After harvest, regeneration was accomplished by natural resprouting and reseedling on good quality hardwood sites, or by planting, mostly Northern Red Oak on productive sites and White Pine on less productive sites. More recently some stands are being managed as uneven-aged stands, and regeneration of the even-age stands is by the shelterwood method.

In regenerated stands, follow-up treatments of crop-tree release and grape vine control have been implemented.

Progeny test sites have been established in three stands, where seedlings grown from selected trees are evaluated for superior characteristics.

There have been trails and roads of many forms in the FEE area as long as there has been human occupation. Currently there are seven designated trails of approximately 15.4 miles in length that are maintained for use. Motorized vehicle trails existed for many years. Keener Spur Motorcycle Trail (FDT #56) was closed to use in 1996. The Flatwoods All Terrain Vehicle Trail (FDT #57) was closed in July 2001 due to watershed concerns for Bluff City Municipal Water Supply. See *Developed and Dispersed Recreation Use and Facilities* under the Social and Cultural section for information on the current trail system.

The current Flatwoods Road (FDR 87) was built in the 1960's. See *Transportation System* under the Social and Cultural section for information on the current road system.

Since the purchase of these lands in the 1920's, fire suppression has been a clear goal of Forest Service Management. Arson-caused wildfires commonly occur in the FEE area. Most recently, wildfires burned over 71 acres in 1998. These fires typically occur under dry, windy conditions, burning in forests that now have 80+ years of fuel buildup.

In recognition of fire's role in shaping the original ecosystems of the Appalachians, and its use as a tool to reduce wildfire hazard, the Forest Service has begun to re-introduce fire under specific conditions. Prescribed fire has been applied on 4151 acres, since 2000. (See Draft Cherokee National Forest North Zone Optimum Fire Regime)

*Other elements of change:*

Approximately 75% of the forested acreage in the FEE area is greater than 70 years old. Communities of older trees like these are often damaged by periodic catastrophic disturbances, such as storms, insects and disease, wildfires, or a combination of factors.

Southern pine beetle is currently very active and will continue to kill pines in the FEE area for several more years. Stands listed as Pine, Pine-Hardwood or Hardwood-Pine make up 30% of this area. This will change the forest type and condition class of many stands.

The exotic pests Gypsy Moth and Hemlock Woolly Adelgid are not present at this time but will impact the area in the future (John Ghent 1994, James Rhea 1994).

The Oak Hazard Report (Steven Oak and Philip Croll 1995), used to evaluate oak decline conditions, shows 1,606 acres to be Vulnerable, 3,942 acres to be Decline Damaged, and 117 acres having Other Damage.

## Social and Cultural Elements

### *Heritage Resources*

A number of archaeological sites, dating from approximately 800 b.c to a.d. 1750 have been documented in the FEE area. All of these sites represent ephemeral occupations for hunting and gathering activities (Bass, 2002). There is no evidence that there were permanent occupations.

The area that includes FEE, was open to Euro-American settlement as early as 1775 when these Cherokee lands were ceded to Euro-American settlers (Bass, 2002). Significant occupation of this area did not occur until the end of the 19<sup>th</sup> century, primarily small farmsteads and pasturelands, and these amounted to only about 100 acres (Bass, 2002). Most of the occupation was along the South Fork of the Holston River, outside of the FEE area or now under South Holston Reservoir.

Although no historic iron mines or furnaces are known in the immediate vicinity, the forest was utilized for charcoal production to fire iron furnaces downriver.

Commercial logging began about 1880. Around 1900, railroad logging came to the Southern Appalachians. The remains of railroad grades and skid trails can be found throughout the area. In March of 1910, fueled by the logging slash, a catastrophic fire burned over much of the area.

The parcels that compose FEE were purchased by the Forest Service from 1922 to 1942 (USDA Land Acquisition Files, CNF, 1912-present). Little physical evidence of the historic Euro-American occupation of the FEE area remains, however, the current existing conditions are the legacy of these activities.

### *Developed and Dispersed Recreation Use and Facilities*

Within the physical boundaries of the FEE area, there is one developed recreation site, Low Gap Campground. Motorized vehicles can access this facility from Holston Mountain's southeast side by FDR #56 and FDR #202. At an elevation of approximately 4,000 feet MSL, Low Gap is open to users except during wet, icy winter months when FDR #56 is gated for user safety and resource protection. Low Gap is a Development Level 2 facility, defined as having little site modification with rudimentary improvements. Amenities include four developed campsites with fire rings and tables, one vault toilet and no potable water. Low Gap is not currently part of the Forest's Recreation Fee Demonstration Program; visitors can use the site without fee.

On the northwest side of Holston Mountain, Flatwoods Road (FDR 87) is the main artery for lower elevation mountain and lake access to South Holston Lake in Sullivan County, TN. The county road known as Panhandle Road off TN 91 in Carter County's Stony Creek community accesses FDR #56 (Mill Creek Road) to FDR #202, Holston Mountain Road, and the Holston Mountain ridgeline.

There are seven trails (#44-50) within this FEE area that provide approximately 15.4 miles for hiking, horseback riding and mountain biking. Each trailhead is signed for use, length and difficulty; intervisible blazes identify route. Several trails ascend to the top of Holston Mountain from both Flatwoods and Old Flatwoods Roads and, because of their steepness, are designated for hiking only. Morrell trail (#47) is designated for hiking and horseback, but not for mountain biking. Both open and closed Forest Service roads are available for non-motorized trail use, and additional opportunities are available for creating loops within the existing system of trails and roads. Trail relocation and re-designation are management options throughout the area.

For many years Sullivan County officials have speculated that motorized trail activity in the Flatwoods area has been the cause of high turbidity in Bluff City's municipal water supply. After a number of heavy rainfall events, the city's Municipal Water Filtration Facility has had to temporarily stop operation. For public health and resource damage reasons, Flatwoods All Terrain Vehicle (ATV) trail (#57) was physically closed to public use in July 2001. Keener Spur Motorcycle Trail (#56) was closed to the public for user safety concerns in 1996. Both areas have been reclaimed for general forest and there are currently no motorized trail opportunities in the FEE area.

In this geographical area, twenty National Forest Recreation Survey (NFRS) sites were identified in the 1959 Forest-wide inventory. Within the FEE area, the majority of these sites are located along drainages and associated with water-based recreation opportunities, while several are located atop Holston Mountain. At present, several of these sites are used for dispersed recreation, including overnight camping. (See Table 9.)

An interpretive tour in the lower Flatwoods area of the watershed was developed in 1995 as an educational tool to demonstrate and interpret timber harvest techniques, fisheries improvements and other forest management practices. Unfortunately, vandalism over the years has made designated stops hard to identify since signage has been destroyed or stolen. Due to lack of funding in recent years, stops have not been maintained nor signage replaced.

The FEE area, like the entire CNF, is part of the Cherokee Wildlife Management Area managed in cooperation with Tennessee Wildlife Resources Management Agency. The area is widely known for recreational hunting, fishing and general forest use. Driving for pleasure is common. Scenery viewing can be enhanced in both the immediate foreground and by creating and improving longer vistas both from atop Holston Mountain and along South Holston Lake.

Lakeside access is available within the area, particularly by vehicle at Big Creek. Areas adjacent to the lakeshore are popular for dispersed camping. Near this project area is Little Oak Recreation Area, a development that includes a 72-unit campground, wildlife viewing areas, trails and a boat launch. Access to this popular developed recreation site is via FDR #87G, off the main corridor of FDR #87 (Flatwoods Road).

Table 9. NFRS Sites in Flatwoods Ecosystem Management Area

Site Name	Site #	Quad	Type	Acres to develop	Buffer acres	In plan?
Big Arm Branch	123	Keenburg	occupancy	11	6	no
Shortleaf Pines	40	Keenburg	occupancy	43	19	no
Weavers Arm Branch	125	Keenburg	occupancy	30	17	no
Delaney Branch	41	Keenburg	occupancy	50	22	no
Miller Branch	121	Keenburg	occupancy	30	10	no
Dogwood Hollow	122	Keenburg	occupancy	40	24	no
Flatwoods Area	128	Carter	occupancy	36	7	no
Morrell Creek	118	Carter	occupancy	30	10	no
Riddle Creek	68	Carter	occupancy	41	15	no
Roaring Fork	67	Carter	occupancy	55	24	no
Little Creek	66	Carter	occupancy, swimming	62	42	no
Big Creek	65.1	Carter	occupancy, boating	34	18	Yes, 4th period
Flint Mill	52	Carter	occupancy	47	13	no
Flint Mill Gap	129	Carter	occupancy	30	21	no
Holston Overlook	70	Carter	occupancy	66	21	no
High Knob	119	Carter	occupancy	24	10	no
Holston Mountain	69	Carter	occupancy	50	28	no
Low Gap expansion	2.9	Keenburg, Carter	occupancy	32	14	no
Low Gap	2.1	Keenburg, Carter	campground	2		no
Little Stony Gap	51	Keenburg	occupancy	29	17	no

Note: The National Forest Recreation Survey (NFRS) of areas for potential recreation development was conducted during the late 1950s/early 1960s. This table is arranged in geographical order from the southwest portion of the study area to Flint Mill and then to the top of Holston Mountain.

### *Special Uses, Lands, Facilities*

On Holston Mountain along FDR #202 are a total of 64 Special Use Permittees, including electronic sites for use by National Oceanic and Atmospheric Administration (NOAA) and local television and radio stations. Holston Mountain Fire Tower, also located on the mountain, has been decommissioned from fire service and partially dismantled. Electronic equipment specific to a Forest Service radio repeater system remains attached to the structure. During winter months under extreme freeze/thaw conditions access to these sites is restricted because the gate at FDR #56 (Panhandle Road) is closed.

In addition to the electronic site Special Uses, Watuaga District records show two permits for powerlines, one for a telephone line, five permits for private roads, one permit for a church parking lot,

and one permit to Bluff City Water Department for Underwood Spring. The locations of these may be found in the hanging map file at the Unicoi Ranger Station or in the GIS database.

There are approximately 34 miles of external boundary lines in the FEE area to maintain. Approximately 9.5 miles of this were re-painted in 2002. In Compartment 114 on Mountain Ridge, 1.3 miles are in need of re-tracement. Some lines have not been painted since 1988. Landlines should be repainted at a minimum of every 10 years.

### *Scenery Management*

In order to manage the visual resource, forestlands were inventoried in the 1980s according to quality, diversity and importance of scenery. From this inventory, Visual Quality Objectives (VQOs) for all forestlands were established in FLRMP standards and guidelines for corresponding management areas. (To learn more about the Visual Management System, see National Forest Landscape Management Handbook, v. 2, ch. 1, "Visual Management System.") During the 1980s and '90s, the inventory was updated on a project-by-project basis. In 1995, the USDA Forest Service updated and refined its system for managing scenery. To incorporate the new system into the forest project and planning process, Forest landscape architects conducted an inventory of CNF's scenic resources during 1997-99 leaf-off seasons. Established distance zones and sensitivity levels from 1980s VQO maps were updated and newly-acquired lands were inventoried, adopting guidelines from the Forest Service's updated Scenery Management System. However, until the FLRMP is revised, the Visual Management System and VQOs established under that system are still valid.

The ridges, coves, valleys and creek corridors characterizing the Holston Mountain Range in Sullivan County, TN (Keenburg and Carter quadrangles) are covered with an almost continuous canopy of soft-to medium-textured rounded tree forms, creating a natural-appearing landscape character. Elevations in the Flatwoods Watershed range from the highest elevation of 4070 feet MSL at Holston High Point to approximately 1730 feet MSL on the shores of South Holston Lake. Views beyond the immediate foreground are influenced by terrain as well as vegetation type and density.

Because of its visual importance as a rock outcrop on Holston Mountain, Flint Rock is inventoried as a "distinctive," or Class A, landscape. All other lands within the watershed are classified as landscape variety class "B," common. Foreground views from South Holston Lake and foreground views from Forest Road 87 (Flatwoods Road) are designated as "Concern Level 1," where a majority of Forest Visitors has a major concern for the scenic qualities (p. 19, NFLM, v. 2, ch. 1, 1977). This includes National Forest Recreation Survey (NFRS) sites that lie along South Holston Lake and Flatwoods Road and the portion of FDR #87C that is included in Flatwoods Auto Tour. Because constituents identified Flint Rock as a *special place of local importance*, that area is designated Concern Level 1 as well. These areas are designated as Scenic Class 1 by the combination of foreground viewing distance and ratings "A" or "B" for scenic attractiveness and "1" for Concern Level.

Steep slopes on Holston Mountain above FDR #87, viewed as middleground from South Holston Lake and its northwestern shore, including the Dam observation site, and from other locations in Sullivan County, are classified as Concern Level "1". This incorporates one road and four trails falling within this acreage: FDR #4202 and Trails 44, 46, 47 and 48. Foreground viewing areas seen from FDR #202,

secondary recreation areas including Low Gap and Holston High Point/High Knob, inventoried NFRS sites not within the FR87 corridor, foregrounds of the fishing streams Big Creek and Miller Branch, and FDR #87C (except the portion included in Flatwoods Auto Tour) and 87D have been inventoried as Sensitivity Level 2.

The remainder of land in this watershed is mapped as "Sensitivity Level 3," including foreground and middleground areas seen from other designated Forest Service and closed historic roads and lands that are seldom seen.

### *Transportation Network*

The current system of classified roads in the FEE area has evolved to meet resource management needs. Past road management policy has resulted in a road network that balances the public's desire for access with resource management objectives. (See Roads Analysis in Appendix D)

The FEE area is in the Transportation Analysis Units (TAU) Watauga (W) 1 and 2. A network of 13 classified forest roads totaling approximately 19.01 miles accesses the area. Of this, 14.58 miles on Forest Development Roads (FDR) #87, 87C, 87D, and 251 are open for year-round use. All other classified roads are closed. FDR's #610803, 61091, 61092, and 61171, totaling 1.57 miles are physically closed to vehicular traffic. FDR's #611101, 4202, and 6112, totaling 1.65 miles, are closed to all but administrative traffic and maintained as linear wildlife openings. FDR's #610820, 61102, 6113, and 202C, totaling 1.91 miles, are closed to all but administrative traffic, Special Use or other authorized traffic. FDR #61102 accesses Underwood Spring, Bluff City's water source, under Special Use Permit. FDR #202C is under Special Use Permit to the Federal Aviation Administration.

The road density for W-2 is 0.71 miles/square mile. W-2 is listed as Bear Sensitive in Amendment #16 of the FLRMP and has a desired density of 0.50. The area does not meet the desired density because of the need to keep public access roads open for access to Little Oak Campground and South Holston Lake. Several of these roads and destinations are outside the FEE area, but contribute to the overall road density in W-2.

The Roads Analysis Process (Appendix 2) inventoried the unclassified roads in the FEE area, and there are assuredly many more unclassified roads that come in from private lands that were not found. Most of these roads are not needed for resource management of the FEE area. Many of these are the result of illegal travel by the public. Some of the roads provide access to South Holston Lake for camping and fishing. Opportunities exist to decide which of these roads need blocked for resource protection, and which roads need added to the classified system to provide legitimate access.

Further access for resource management will mostly be temporary roads that will be reclaimed after use. These temporary roads will not contribute to the existing road network. Any additional classified road construction would be considered during NEPA analysis for individual projects, informed by the Roads Analysis.

## **Management Direction**

The FLRMP divides the CNF into 18 Management Areas (MA's), which are groupings of national forest lands with similar land and resource characteristics, similar management goals and common management prescriptions. The FEE area has land in 7 MA's.

The Goals of these MA's:

### **MA 1- Developed Recreation Sites.**

Maintain the present range and quality of developed recreation sites to contribute to the public's enjoyment of the forest. Provide additional facilities as necessary to meet projected demand.

### **MA 2- Undeveloped Recreation Sites.**

Maintain the existing character of this management area and protect those attributes that would contribute to the desirability of the site for the development of a high quality recreation area.

### **MA 5- Highly Sensitive (visual) Areas: areas along the shore of Holston Lake.**

Achieve the visual quality objective of retention. Provide the opportunity for timber harvest consistent with retention goal while providing for dispersed recreation use opportunities and wildlife habitat.

### **MA 13-Special Uses.**

Provide locations for major special uses on the Forest when the opportunity does not exist on private land. Special Uses must be compatible with overall Forest Goals and provide for other resource use. Management practices for other resources should not interfere with facility objectives.

### **MA 15- Late Succession Wildlife/Timber with Roads Closed.**

Manage wildlife habitat to emphasize late succession wildlife species. Manage timber in an economically efficient manner with some improvement of damaged, sparse, and low quality stands. Organize and regulate harvest to achieve sustained yield. Maintain roaded natural Recreation Opportunity Spectrum (ROS) character with roads closed. Manage other resources in an economically efficient manner while meeting above goals.

### **MA 17- Early Succession Wildlife/Timber with Roads Open.**

Manage timber in an economically efficient manner with some improvement of damaged, sparse, and low quality stands. Organize and regulate harvest to achieve sustained yield. Provide habitat for early successional wildlife species through coordination with the timber management program. Maintain a high degree of vegetative diversity. Newly constructed roads may be left open to meet other resource objectives. Maintain roaded natural ROS character. Manage other resources in an economically efficient manner while meeting above goals.

### **MA 18- Riparian Areas.**

Manage under the principals of multiple use and sustained yield while emphasizing protection and improvement (where applicable) of the totally dependent resources, soil, water, vegetation, fish, and certain wildlife resources.

## **Opportunities and Possible Management Practices**

When there is a difference between existing conditions and the goals of the Cherokee Forest Plan, opportunities emerge that could move the ecosystem toward the desired condition. These opportunities could be addressed by one or more of the possible management practices in Table 10.

The responsible official may select various possible management practices (Table 10) into proposed actions. At that point, scoping would be conducted and an appropriate level of analysis would occur to determine the environmental effects and significance, after which a decision would be made.

**Table 10. Possible Management Practices**

<i>Goals of the Cherokee Forest Plan</i>	<i>Existing Condition</i>	<i>Opportunity</i>	<i>Possible Management Practices</i>
<p>Manage fish and wildlife habitat to maintain viable populations of existing and native vertebrate species and to maintain or improve habitat of management indicator species. Page IV-2</p> <p>Provide for diversity of plant and animal communities. Page IV-2</p>	<p>8,547 acres, or 66% of the forest is between 71-100 years of age. 35% is 71-80 years old; 18% is 81-90 years old; and 12% is 91-100 years old. No other 10 year-age class comprises more than seven percent of the total acreage.</p>	<p>Diversify overall age class distribution by reducing acreage in these age classes through management. Emphasis should be placed on those stands in the 70-80 year age class that comprised 35% of the forested acreage.</p>	<ol style="list-style-type: none"> <li>1. Minimize regeneration activities within stands greater than 100 years of age.</li> <li>2. Regenerate some stands through timber harvest, slashdown, or stand replacement fires.</li> <li>3. Inventory stands damaged by southern pine beetle and update CISC to reflect current stand age and forest type.</li> <li>4. Clear some areas for use as openings.</li> <li>5. Alter stand age through timber stand improvement or selective harvest (overstory removal).</li> </ol>
	<p>1,148 acres, or 9% of the forest is greater than 100 years of age.</p>	<p>Increase old growth.</p> <p>Within compartments managed for late successional species (MA 15), attain 25% of the forested acreage greater than 100 years of age by 2010, and 35% by 2020.</p> <p>Within compartments managed for early successional species (MA 17), attain 5% of the forested acreage greater than 100 years of age by 2010. Manage not to drop below this level.</p>	<ol style="list-style-type: none"> <li>6. Minimize regeneration activities within the 91-100 year age class.</li> <li>7. Do not harvest in existing old growth stands.</li> <li>8. Designate the recharge area for the Bluff City water supply for old growth management.</li> <li>9. Designate additional bear denning habitat within Compartment 106.</li> </ol>
	<p>300 acres, or 2% of the forest is less than 10 years of age. The average between 1961-91 was 716 acres, or 5.5% of the forested acreage.</p>	<p>Increase early successional habitat to meet 0-10 standards and guidelines.</p> <p>Place 290 acres (6% of suitable acreage) of forest within the 0-10 year age class by 2010 within compartments managed for late successional species (MA 15). Maintain this minimum acreage over each successive ten-year period.</p> <p>Place 340 acres (11% of the suitable acreage) of forest within the 0-10 year age class by 2010 within compartments managed for early successional species (MA 17).</p>	<ol style="list-style-type: none"> <li>10. Set-back existing early successional forest by burning, slashdown, or herbicides.</li> <li>11. Create new seedling/sapling stands through timber harvest, slashdown, injection, or stand replacement fires.</li> <li>12. Create new seedling/sapling stands by allowing remaining open areas to succeed to a forested condition.</li> <li>13. Permanently manage designated areas for 0-10 year forest conditions.</li> </ol>

<i>Goals of the Cherokee Forest Plan</i>	<i>Existing Condition</i>	<i>Opportunity</i>	<i>Possible Management Practices</i>
<p>(CONTINUED)</p> <p>Manage fish and wildlife habitat to maintain viable populations of existing and native vertebrate species and to maintain or improve habitat of management indicator species. Page IV-2</p> <p>Provide for diversity of plant and animal communities. Page IV-2</p>	<p>Compartments 112-115 are managed for early successional species, but minimum 0-10 year age class requirements have not been met since the 1970's. Currently only 10 percent of Compartments 112-115 is in stands less than 30 years of age.</p>	<p>Commit to meeting the 0-10 year age class requirements for MA 17.</p>	<ol style="list-style-type: none"> <li>14. Set-back existing early successional forest by burning, slashdown, or herbicides.</li> <li>15. Create new seedling/sapling stands through timber harvest, slashdown, injection, or stand replacement fires.</li> <li>16. Create new seedling/sapling stands by allowing remaining open areas to succeed to a forested condition.</li> <li>17. Permanently manage designated areas for 0-10 year forest conditions.</li> </ol>
		<p>Re-designate Compartments 112-115 for management of late successional species.</p>	<ol style="list-style-type: none"> <li>18. Amend the current Forest Plan.</li> <li>19. Make this change as part of the new Forest Plan.</li> <li>20. Continue current level of management.</li> </ol>
	<p>Future hard mast availability is threatened by oak decline, stand maturity, and Gypsy moth.</p>	<p>Increase hard-mast availability.</p>	<ol style="list-style-type: none"> <li>21. Release hard mast producing trees from competition and suppression.</li> <li>22. Conduct midstory treatments prior to timber harvest to promote advanced oak regeneration.</li> <li>23. Promote oak regeneration and reduce competition from other species through prescribed burning.</li> <li>24. Leave oaks, hickories, and beech as leave trees in shelterwood areas and when daylighting wildlife openings.</li> <li>25. Plant oaks, hickories, beech, walnuts and chestnuts within suitable habitat.</li> </ol>
<p>Soft mast production has declined over the past 20 years due to fire suppression and decreases in early successional habitat.</p>	<p>Increase soft mast availability.</p>	<ol style="list-style-type: none"> <li>26. Conduct understory burns to reduce Mountain laurel and rhododendron and promote the growth of blueberries.</li> <li>27. Release and maintain mast plantings in wildlife openings.</li> <li>28. Reintroduce historic varieties of fruit trees to new and existing wildlife openings.</li> <li>29. Increase light reaching the forest floor through silvicultural treatment of stands (TSI, injection, Single tree selection, etc.)</li> <li>30. Promote soft mast producing shrubs and vines (grapes, blackberry, etc) along managed openings.</li> <li>31. Plant native soft mast producing species such as cherry, Persimmon, and Serviceberry.</li> </ol>	

<b>Goals of the Cherokee Forest Plan</b>	<b>Existing Condition</b>	<b>Opportunity</b>	<b>Possible Management Practices</b>
<p>(CONTINUED)</p> <p>Manage fish and wildlife habitat to maintain viable populations of existing and native vertebrate species and to maintain or improve habitat of management indicator species. Page IV-2</p> <p>Provide for diversity of plant and animal communities. Page IV-2</p>	<p>Many springs and streams dry out or flow underground during summer and fall reducing water availability.</p>	<p>Increase water availability</p>	<p>32. Create wildlife water holes.</p> <p>33. Create small ponds.</p> <p>34. Create larger ponds for fire suppression and wildlife.</p> <p>35. Bring subsurface flow back above ground using a pipe and pool, or moving rocks to expose a small area of subsurface flow.</p>
	<p>Currently there are 19 acres of managed wildlife openings in the FEE area.</p>	<p>Establish and maintain wildlife openings to provide early spring forage, soft mast along edges, and nesting and brooding habitat.</p>	<p>36. Convert existing gated roads into linear wildlife openings.</p> <p>37. Evaluate old roads in area for wildlife openings.</p> <p>38. Link spot openings with a linear wildlife opening.</p> <p>39. Create wildlife openings through timber harvest.</p> <p>40. Maintain openings through mowing, burning, rehabilitating, top dressing, daylighting, etc.</p> <p>41. Cooperate with other agencies, local and national groups to maintain and improve habitat.</p> <p>42. Plant native grasses in existing and new openings.</p> <p>43. Utilize new openings as a native grass seed nursery.</p> <p>44. Maintain open areas through mowing, grazing, burning, or herbicides.</p> <p>45. Manage openings and edges for Golden-winged warblers above 3,000 feet MSL.</p>
	<p>Compartments 105-110 are designated bear significant. Compartments 111 and 117 are managed for late successional species.</p>	<p>Provide suitable habitat conditions for black bear in the area.</p>	<p>46. Increase the amount of bear denning habitat by increasing the acreage in the 100+ year age class.</p> <p>47. Better diversify the present age class distribution to provide a mixture of habitat conditions to meet the diverse needs of Black bear in the area.</p> <p>48. Monitor visitor use and bear activity so that any negative trends can be identified.</p> <p>49. Work cooperatively with TWRA to conduct bear surveys in the area.</p>
	<p>Compartment 106 only has 2% of cove and upland hardwood habitat designated as Bear significant. A minimum of 5% is required.</p>	<p>Meet bear significant area standards and guidelines within Compartment 106.</p>	<p>50. Designate an additional 32 acres of cove or upland hardwood forest as bear significant in Compartment 106 to meet standards and guidelines.</p>

<i>Goals of the Cherokee Forest Plan</i>	<i>Existing Condition</i>	<i>Opportunity</i>	<i>Possible Management Practices</i>
	Open road density currently exceeds standards and guidelines for a bear significant area.	Reduce open road density to improve habitat suitability for bears.	51. Evaluate existing open road system and maintain or reduce existing road density in the area. 52. Close any new roads constructed for management. 53. Identify and eliminate illegal access roads.
		Eliminate illegal use by 4WDs in wildlife opening at Big Creek off FDR 87D.	54. Block access and monitor with assistance from Law Enforcement.
(CONTINUED) -Manage fish and wildlife habitat to maintain viable populations of existing and native vertebrate species and to maintain or improve habitat of management indicator species. Page IV-2	Several invasive exotic species are present in the area.	Evaluate and prioritize exotic species so control measures can be implemented.	55. Evaluate each exotic species on present status, ability to implement control measure, threat to native species in the area with emphasis on rare species and communities, and effectiveness of control measures. 56. Determine where control measures are needed and implement where control can be achieved. 57. Work cooperatively with adjacent landowners to educate them on invasive species to prevent spread. 58. Utilize seed sources with high purity standards.
-Provide for diversity of plant and animal communities. Page IV-2	Beaver and other species (otter, fisher) and their natural functions are missing from FEE area	Re-establish Beaver and other species into the FEE area	59. Stock and monitor missing species. 60. Monitor effects to the forest ecosystem.
	Chestnut is missing from the ecosystem	Introduce Blight-resistant Chestnuts to FEE area	61. Evaluate the feasibility and desirability of introducing hybrid Chestnuts. 62. Plant blight-resistant Chestnuts.
	The present vegetation and the current even-age management does not reflect what existed prior to significant human alteration.	Return this area to an uneven-age condition, reproducing by gap-phase regeneration	63. Initiate a uneven-age management system base on single-tree selection method.
	Fire has a reduced role in the ecology of the FEE area	Re-instate Fire as a tool in management, especially in the upper slope and ridge crests where lightning once played a greater role.	64. Utilize Prescribed Fire to regenerate fire-dependant timber types, especially yellow pine types.
-Give special consideration to protection and improvement of habitat of threatened and endangered plant and animal species in cooperation with State and Federal agencies. Page IV-3	Additional inventories are needed to evaluate the status of rare communities.	Conduct additional inventories from which site-specific management plans can be developed.	65. Conduct additional rare plant and animal inventories within rare communities. 66. Work cooperatively with universities, state agencies, and the public to inventory existing sites, and identify any other rare communities in the area. 67. Work cooperatively with private landowners to assist with management of rare communities on private lands. 68. Develop site-specific management plans. 69. Acquire rare communities on adjacent private lands.

<b>Goals of the Cherokee Forest Plan</b>	<b>Existing Condition</b>	<b>Opportunity</b>	<b>Possible Management Practices</b>
<p>(CONTINUED) -Give special consideration to protection and improvement of habitat of threatened and endangered plant and animal species in cooperation with State and Federal agencies. Page IV-3</p>	<p>14 rare plant species are known to occur in the FEE area. Many records are more than 15 years old and some undocumented reports of other rare species are known.</p>	<p>Conduct inventories to increase are knowledge of rare species in the area.</p>	<p>70. Revisit sites that have not been updated in the past 15 years. 71. Try to validate undocumented reports. 72. Monitor existing sites. 73. Continue to conduct surveys to document new species and occurrences. 74. Work cooperatively with universities, and state agencies to promote research in the area.</p>
	<p>Gray bats are known to occur in Sullivan County, but have not been located within the FEE area.</p>	<p>Determine the status of the Gray bat within the FEE area.</p>	<p>75. Attempt to detect Gray bats in the area through Anabat surveys. 76. Attempt to detect Gray bats through mist-netting within suitable habitat. 77. Utilize existing databases and talk to cavers and area residents to develop an inventory of caves and open mines in the area. 78. Conduct breeding and hibernating bat surveys within area caves.</p>
	<p>Indiana bats are not known from Carter or Sullivan County, but suitable habitat is present.</p>	<p>Determine the status of the Indiana Bat within the FEE area.</p>	<p>79. Attempt to detect Indiana bats in the area through Anabat surveys. 80. Attempt to detect Indiana bats through mist-netting within suitable habitat. 81. Conduct hibernating bat surveys within area caves.</p>
	<p>Bald eagles are utilizing South Holston Lake and the Holston River throughout the year, but no breeding has been documented.</p>	<p>Determine the population status of Bald eagles in the area.</p>	<p>82. Conduct surveys for wintering and breeding eagles. 83. Continue to participate in the mid-winter eagle survey. 84. Work with area marinas, stores, and fishing clubs to report eagle sightings and activity. 85. Improve nesting habitat for Bald eagles by creating flight windows in and around potential nest trees.</p>
	<p></p>	<p>Improve habitat conditions for the Bald eagle in the Flatwoods area.</p>	<p>86. Leave potential nest trees within and/or along edges of regeneration areas. 87. Work cooperatively with TWRA and the USFWS to establish specific management guidelines in areas surrounding eagle nests.</p>
	<p>Ospreys are present in the FEE area, but their breeding status is not well documented.</p>	<p>Improve existing knowledge of Osprey activity in the area.</p>	<p>88. Conduct breeding bird surveys for Osprey. 89. Work cooperatively with other agencies to place and monitor Osprey nesting platforms on South Holston Lake.</p>

<i>Goals of the Cherokee Forest Plan</i>	<i>Existing Condition</i>	<i>Opportunity</i>	<i>Possible Management Practices</i>
<p>CONTINUED) -Give special consideration to protection and improvement of habitat of threatened and endangered plant and animal species in cooperation with State and Federal agencies. Page IV-3</p>	<p>Appalachian cottontail habitat is present along the crest of Holston Mountain.</p>	<p>Determine if Appalachian cottontail rabbits occur on Holston Mountain.</p>	<p>90. Survey appropriate habitat for the presence of Appalachian cottontail.</p>
		<p>Introduce the Appalachian cottontail rabbit on top of Holston Mountain.</p>	<p>91. Evaluate habitat suitability for the Appalachian cottontail. 92. Manage for suitable Appalachian cottontail rabbit habitat within communication sites. 93. Implement habitat improvement projects to improve habitat if needed. 94. Worked with TWRA and other agencies to transplant and monitor Appalachian cottontail. 95. Maintain suitable habitat following establishment.</p>
<p>-Provide safe and sanitary developed and dispersed recreation opportunities. Page IV-4</p>	<p>Flatwoods Road (FR#87) is a link to hiking, horse, bicycle trails; access to South Holston Lake, and developed and dispersed camping. Facilities for overnight camping and boat launching for campers are available at Little Oak Recreation Area.</p>	<p>Continue to develop Flatwoods Road as a recreational corridor.</p>	<p>96. Pave Flatwoods Road to enhance developed and dispersed recreational use of the area; include wide shoulders as horse and bicycle lanes. 97. Implement a use fee for the entire length of Flatwoods Road corridor; create corridor entry kiosks near Old Flatwoods Road and US 421; sell annual passes at local stores if fee is implemented. 98. Develop inventoried NFRS sites for day use such as picnicking, swimming, boat launching; (particularly Big Creek, #65.1, Little Creek, #66.0, and other just outside the boundaries of this project like Cherokee Camp, #23.0 and Big Ridge, #64.0). 99. Create links to Little Oak Recreation Area as the major developed facility in the area. 100. Explore potential conflicts between future recreation development and genetic seed plantations near South Holston Lake.</p>
	<p>The road along the top of Holston Mountain (FR 202) provides access to Low Gap campground, dispersed hunting, trails linking to Flatwoods Road, gated FDR 4202 and 9.5-mile Holston Mountain Trail (#44)</p>	<p>Improve hunting and wildlife viewing use atop Holston Mountain; use existing roads and trails to create long distance trail corridors</p>	<p>101. Consider use of Low Gap campground as an equestrian overnight camping facility. 102. Consider fee for use of Low Gap Campground and improve and/or add amenities. 103. Improve trailhead parking along FDR 202</p>
	<p>Wildlife viewing opportunities are limited within established recreation sites.</p>	<p>Increase wildlife viewing opportunities within existing and future recreation sites.</p>	<p>104. Install nest boxes along trails to increase viewing opportunities. 105. Establish small viewing sites to attract wildlife. 106. Plant butterfly gardens and put up interpretive signs. 107. Conduct wildlife hikes.</p>

<i>Goals of the Cherokee Forest Plan</i>	<i>Existing Condition</i>	<i>Opportunity</i>	<i>Possible Management Practices</i>
<p>Design interpretive service programs to inform the public of management activities, obtain visitor feedback, increase public understanding of Forest Service management and provide safe and enjoyable use of recreation opportunities. Page IV-4</p>	<p>The range of recreation opportunities in this area is little known to a wide audience outside the local area. Existing information is limited to trail narratives, Little Oak ROG and National Geographic trail maps available at northern district Ranger Stations.</p> <p>Former Flatwoods Auto Tour currently is unsigned and not maintained.</p>	<p>Provide the public with more information about the Flatwoods area as a recreation destination</p>	<p>108. Insert developed recreation information into Forest web page.</p> <p>109. Create official Trail ROGs for Flatwoods trails. Use as hardcopy information sheets and add to Forest web page.</p> <p>110. Create ROGs for dispersed use, including camping, wildlife viewing, fishing and others.</p> <p>111. Provide corridor information at entrance information stations.</p> <p>112. Develop partnerships with local stores to provide visitor information.</p>
		<p>Evaluate the value of Flatwoods Auto Tour as a forestry/ecosystem educational tool</p>	<p>113. Keep tour dynamic by: identifying locations for continued management; interpreting management practices and their locations through link to Forest web page; and provide companion audio interpretation</p> <p>114. Monitor use of web site and on-the-ground tour</p> <p>115. Promote use to appropriate markets</p> <p>116. Disband tour, eliminate signs, etc.</p>
<p>Preserve important historic, cultural and natural aspects of the CNF. Page IV-4</p>	<p>The public has a poor understanding of the Southern Appalachian forest ecosystem prior to human alterations.</p>	<p>Educate and inform the public of this legacy</p>	<p>117. Initiate a mixed media interpretive program for the public of the forest ecosystem prior to human alterations, changing land-use patterns, and their effects to the ecosystem.</p>
<p>Improve, enhance, maintain or not permanently detract from the visual characteristics of the landscape. Page IV-4</p>	<p>There is moderate to high scenic integrity in Low Gap Recreation Area, inventoried NFRS sites, foregrounds of Trail #44 (Holston Mountain), #45 (Josiah Horse), #46 (Flatwoods), 48 (Short Spur), 49 (Flint Mill) and 50 (Josiah), and along most foregrounds of FDR #87, #202, #4202, #56A and #87D. The scenic integrity of middleground views of Holston Mtn. are moderate to high, while scenic integrity in some portions of Forest Roads 87A and 87B, Morrell Trail #47 near the utility corridor and Flatwoods ATV Trail #57 are low. The scenic integrity ranges from low to high in general forest lands and roads not previously described, where foregrounds are visible to forest users, and in seldom seen areas in the general forest.</p>	<p>Reflect various levels of public concern for scenery by maintaining or enhancing scenic values in the identified travelways and use areas and in the general forest area</p>	<p>118. Maintain and improve existing scenic integrity levels along FDR 87, trail corridors and viewshed of Holston Mountain from South Holston Lake and residential areas on northwest side of lake</p> <p>119. Create vistas along Flatwoods Road to view South Holston Lake and Holston Mountain.</p> <p>120. Create vistas and overlooks along FDR 202 atop Holston Mountain to view South Holston Lake.</p> <p>121. Create vistas along developed trail systems.</p> <p>122. Include vista management and resource protection in trails strategy for this watershed.</p> <p>123. Develop signage to interpret views from selected locations like Flint Rock.</p>

<b>Goals of the Cherokee Forest Plan</b>	<b>Existing Condition</b>	<b>Opportunity</b>	<b>Possible Management Practices</b>
<p>Reduce or prevent unacceptable timber losses from insects and diseases using integrated pest management techniques. Page IV-3</p>	<p>There are many damaged, sparse, and low quality stands within the FEE area and there will be more before the southern pine beetle infestation subsides.</p>	<p>Regenerate some of these stands.</p>	<p>124. Sell timber where possible. 125. Allow firewood gathering where appropriate and slash down the remaining stems. 126. Regenerate using non-commercial slashdown.</p>
	<p>There are many stands which are susceptible to Gypsy moth defoliation and vulnerable to damage once defoliated.</p>	<p>Reduce stand susceptibility and vulnerability.</p>	<p>127. Thin stands to remove moth-favored food species. 128. Regenerate stands that have a high percentage of susceptible species. 129. Thin stands to remove vulnerable trees.</p>
<p>Provide a comprehensive trail system for hiking, horse-back riding, cycling, and interpretation. Page IV-3</p>	<p>There are seven designated trails (#44-50) that provide 15.4 miles for hiking, horseback riding, and mountain biking. Popular trails ascending Holston Mountain, including Morrell, Short Spur, Flint Mill (#49), and Josiah (#50), are steep, linear routes that connect with Flatwoods Trail (#46) and Holston Mountain Trail (#44).</p>	<p>Emphasize multi-use trail opportunities where appropriate</p>	<p>130. Create systems of loops using existing trails, forest roads and connectors; link Flatwoods Trail a/k/a the Old Mule Trail (#46) with FDR 87A; redesignate Josiah #50 for horse use and provide parking at jct with FDR 87, develop trailhead near intersection of Morrell Trail (#47) trail and FDR 87; use FDR 6100 (dropped from system) to connect FDR 87B and FDR 87 and establish trailhead at intersection of FDR 6100 and 87; improve trailheads on FDR 87 at junctions of Josiah Horse Trail (Trail # 45), FDR 87A and FDR 87B.  131. Re-designate portion of Holston Mtn. Trail (#44) to create bicycle and horse loops with FDR 4202; monitor use at established trailhead east of FDR 56.  132. Develop horse camping near Morrell Trail(#47) and FDR 87, using NFRS inventory for guidelines (particularly Riddle Creek, #68.0, Roaring Fork, #67.0 and Little Creek, #66.0 and Big Ridge, #64.0).  133. Encourage use of camping facilities at Little Oak Recreation Area by mountain biking enthusiasts.  134. Replace bridge at Big Creek on FDR 87D.  135. Coordinate bicycle and equestrian trail planning with local trail clubs and groups.  136. Look for partnerships to develop trail loops and amenities; identify groups as maintainers  137. Develop management strategy to protect resources at designated locations like Flint Rock.  138. Develop partnerships with TVA and private landowners for long-term corridor connections through the regional greenways coalition, Southern Appalachian Greenways Alliance.</p>
		<p>Improve opportunities for hiking</p>	<p>139. Develop series of long and short loops using existing and newly established trails.</p>

<i>Goals of the Cherokee Forest Plan</i>	<i>Existing Condition</i>	<i>Opportunity</i>	<i>Possible Management Practices</i>
<p>Determine where off-road vehicle use opportunities exist. Page IV-3</p>	<p>Since the closure of Flatwoods ATV trail, no opportunities currently exist</p>	<p>Consider creating a longer system of ATV loops.</p>	<p>140. Reopen portions of Keener Spur (#56) up Holston Mtn. to Big Gap and southwest to Lock Ridge and connect with FDR 6065 to create a loop; develop trailhead near intersection of Morris Branch Road at FDR 6065; develop a trailhead on FDR 202A at Little Stony Gap; connect with a series of loops on southeast side of Holston Mtn near Little Stony Creek and Furnace Branch at a later date. Note: Trailhead on FDR 202A at Little Stony Gap will be closed during winter and spring months.</p> <p>141. Develop plan to monitor effects of trail system and develop and maintain signs and trailhead amenities.</p> <p>142. Consider trail use fees to maintain new trails.</p> <p>143. Look for partnerships to develop trail loops and amenities.</p>
		<p>Consider alternate ATV routes outside Bluff City municipal watershed area.</p>	<p>144. Look for partners to host, plan and develop trail loops and amenities.</p>
<p>Conserve soil and water resources and prevent significant or permanent impairment of the productivity of the land. Page IV-3</p>	<p>Road to Underwood Spring is open to public with several illegal spur roads present resulting in sediment problems in the stream.</p>	<p>Provide controlled access to Underwood Spring.</p>	<p>145. Gate the road to Underwood Spring in cooperation with adjacent private landowners.</p> <p>146. Improve water crossings on road.</p> <p>147. Place water bars on road improve water drainage on road.</p> <p>148. Block and seed existing illegal roads.</p> <p>149. Work cooperatively with local residents to document illegal use.</p>
		<p>Obliterate illegal roads.</p>	<p>150. Block and revegetate all roads in Underwood Spring watershed which are not required or authorized.</p>
		<p>Deter illegal dumping and roads</p>	<p>151. Clean up existing dump sites.</p> <p>152. Block existing illegal roads.</p> <p>153. Increase Law Enforcement presence in area.</p>
	<p>Illegal dumping and illegal access are problems in the FEE area</p>	<p>Educate public on negative impacts of dumping and illegal trails</p>	<p>154. Send out an educational flyer to surrounding residents.</p> <p>155. More signage of rules, regulations, and fines.</p> <p>156. Establish a reward for reporting illegal activities.</p>

<i>Goals of the Cherokee Forest Plan</i>	<i>Existing Condition</i>	<i>Opportunity</i>	<i>Possible Management Practices</i>
(CONTINUED) Conserve soil and water resources and prevent significant or permanent impairment of the productivity of the land. Page IV-3	Flatwoods ATV Trail (FDT 57) was closed to public use and de-commissioned in July 2001. Access to the trail and trailhead parking are blocked. The trail was ripped, seeded and fertilized with trees felled across the trail and trailhead parking. Closure signs were placed on Highway 19E and along Flatwoods Road. Notes to media were sent to local newspapers and personal contact made with area ATV Distributors announcing area closure.	Trail closed July, 2001 after Specialists review of area and coordination with City of Bluff City, TN officials regarding high levels of turbidity in filtration system adjacent to trail.	157. Continue to monitor soil and water erosion and stream crossings as necessary.
Consolidate National forest lands within existing units, with emphasis on those areas where National forest lands constitute an appreciable proportion of the area, and where additional land valuable for forest purposes is available to ensure protection and use of National forest resources. Page IV-4	Outholdings are not being managed due to access issues.	Determine significance of outholdings and determine best overall use of property.	158. Conduct archeological and natural resource inventories to determine their significance. 159. If significant, work with adjacent landowners to provide access for management and link to existing Forest Service lands. 160. If not significant, consider land exchanges which would consolidate existing Forest Service boundaries.
Allow special uses only on lands suitable for the uses and under conditions which protect the public interest, including the proper consideration of environmental quality and landscape integrity. Page IV-4	There are 64 electronic sites as special uses along FDR 202 atop Holston Mountain; access is limited during winter months due to icy and wet weather conditions (usually mid-Dec through mid-March).	Continue to manage special uses within carrying capacity of Holston Mountain corridor.	161. Manage current uses. 162. Evaluate renewals and replacements on case-by-case basis. 163. Continue to monitor road conditions on FDR 56 and 202 to provide safe access and maintain current and desired road management objectives.
Develop a program to establish boundary lines to standards and to resolve land claims and trespasses. Page IV-4	Approximately 9.5 miles of landline were maintained in 2002. About 1.3 miles of landline needs surveyed. Some lines have not been maintained since 1988.	Bring all landlines up to standard.	164. Maintain 34 miles of landline 165. Retrace 1.3 miles of landline
Minimize hazards from flood, wind, wildfire and erosion. Page IV-3	66% of the area is between 71-100 years old. Maturing stands will become increasingly susceptible to damage from natural forces.	Reduce wildfire hazard with fuel-reduction burns. Diversify age-classes through active management.	166. Prescribed Burns for fuel reduction. 167. Regenerate stands to create diversity in age classes through timber harvest.
Provide public traffic access to National forest lands where compatible with management of other resources. Page IV-3	There are 15 classified roads serving the FEE area and approximately 27 unclassified roads. See Appendix D.	Develop a road system that is safe and responds to public needs, is well-managed with minimal environmental effects, and is in balance with available funding.	168. Classify needed and desired unclassified roads, close remaining unclassified roads-Use Roads Analysis Process to inform. Implement RAP team's opportunity list.

## Appendices

### Appendix A – Soils

#### SOIL SURVEY LEGEND SULLIVAN COUNTY CHROKEE NATIONAL FOREST

MAP SYMBOL	MAP UNIT NAME
3E	Brookshire Silt Loam, 20 to 35 Percent Slopes
3F	Brookshire Silt Loam, 35 to 50 Percent Slopes
6E	Cataska Shaly Silt Loam, 20 to 35 Percent Slopes
6F	Cataska Shaly Silt Loam, 35 to 50 Percent Slopes
6G	Cataska Shaly Silt Loam, 50 to 80 Percent Slopes
7F	Cataska Stony Loam, 35 to 50 Percent Slopes
9E	Ditney Sandy Loam, 20 to 35 Percent Slopes
9F	Ditney Sandy Loam, 35 to 50 Percent Slopes
9G	Ditney Sandy Loam, 50 to 80 Percent Slopes
10C	Junaluska Loam, 5 to 12 Percent Slopes
10D	Junaluska Loam, 12 to 20 Percent Slopes
10E	Junaluska Loam, 20 to 35 Percent Slopes
11E	Jeffrey Loam, 20 to 35 Percent Slopes
11F	Jeffrey Loam, 35 to 50 Percent Slopes
12D	Litz Variant Silt Loam, 12 to 20 Percent Slopes Shallow Phse
12E	Litz Variant Silt Loam, 20 to 35 Percent Slopes Shallow Phse

- 12F Litz Variant Silt Loam, 35 to 50 Percent Slopes  
Shallow Phse
- 12G Litz Variant Silt Loam, 50 to 80 Percent Slopes  
Shallow Phse
- 15D Maymead Loam, 12 to 20 Percent Slopes
- 15E Maymead Loam, 20 to 35 Percent Slopes
- 15F Maymead Loam, 35 to 50 Percent Slopes
- 18E Shelocta Silt Loam, 20 to 35 Percent Slopes
- 18F Shelocta Silt Loam, 35 to 50 Percent Slopes
- 19F Shelocta Silt Loam, 35 to 50 Percent Slopes
- 2D Shouns Loam, 12 to 20 Percent Slopes
- 22C Tate Stony Loam, 5 to 12 Percent Slopes
- 22D Tate Stony Loam, 12 to 20 Percent Slopes
- 22E Tate Stony Loam, 20 to 35 Percent Slopes
- 23G Unicoi Stony Sandy Loam, 50 to 80 Percent Slopes

**TABLE A-1: Characteristics and Suitability ratings for Soils in comps. 105-115 & 117**

Characteristics	Shouns	Brookshire	Cataska	Ditney	Junaluska	Jeffrey
Soil ID	2D,E	3E,F	6E,F,G&7F	9E,F,G	10 C,D	11E,F
Soil Depth (inches)	0-60	0-53	0-24	0-30	0-40	20-36
Surface Texture	Loam	Silt Loam	Silt Loam	Sandy Loam Loam	Loam	Loam
Subsurface Texture	Loam	Gravelly Silt Loam	Shaly to very Shaly Silt Loam	Cobbly Sandy Loam	Loam to Clay Loam	Gravelly Loam
Landform	Foot and toe slopes	Coves	Ridges & Side Slopes	Ridge/Side Slope	Ridge	Ridge/Side Slope
Parent Material	Phyllite, Sandstone, Shale	Phyllite & Sandstone	Phyllite	Sandstone	Sandstone	Phyllite, Sandstone, Slate
Drainage Class	Well Drained	Well Drained	Excessively	Well Drained	Well Drained	Well Drained
Soil Permeability	Moderate	Mod to Mod Rapid	Moderate	Moderately Rapid	Moderate Rapid	Moderate Rapid
Soil Runoff	Medium	Medium	Rapid	Medium	Slow	Medium
Erosion Hazard	Moderate	Moderate/e	Slight	Moderate to Severe	Slight	Moderate to Severe
Equipment Limits	Slight	Moderate	Moderate	Moderate to Severe	Slight to Moderate	Moderate to Severe
Compaction Hazard	Slight	Moderate	Moderate	Moderate	Moderate	Moderate to Severe
Slope Range	5 to 20%	20 to 50%	20-80%	20 to 80%	5 to 35%	12 to 50%
Soil Reaction (Ph)	4.5 to 6.0	5.1 to 5.5	5.1-5.5	4.5 to 5.5	4.5 to 5.5	4.5 to 6.0
Preferred Species	Yellow Pop, White & Vir Pine	S.Leaf, Virginia & White Pine	Pitch Pine Chestnut oak	S.Leaf, Vir.& White Pine	N.Red Oak S.Leaf Pine White Pine	N.Red Oak, Hickory, Cherry

**TABLE A-1 Con't. : Characteristics and Suitability ratings for Soils in compartments 105-115 & 117**

Characteristics	Litz	Maymead	Shelocta	Shelocta	Tate	Unicoi
Soil ID	12 D,E,F,G	15D,E,F	18E,F	19F	22C,D,F	23G
Soil Depth (inches)	0-16	0-70	0-60	0-60	0-50	0-20
Surface Texture	Shaly Silt Loam	Loam	Silt Loam	Loam	Stony Loam	Stony Sandy Loam
Subsurface Texture	Shaly Silt Loam	Cobbly Loam	Shaly Silty Clay Loam	Gravelly Silt Loam	Stony Loam	Cobbly Sandy Loam
Landform	Ridge/Side Slope	Cove, Toe Slopes	Cove, Foot Slope	Cove, Foot Slope	Cove, Benches, Foot Slopes	Upper Side Slope
Parent Material	Shale	Phyllite Sandstone	Shale Silt Stone Sandstone	Shale, Silt Stone	Granite Gneiss Schist	Sand Stone Silt Stone
Drainage Class	Excessively Drained	Well Drained	Well Drained	Well Drained	Well Drained	Excessively Drained
Soil Permeability	Moderate	Mod. Rapid	Moderate	Moderate	Moderate	Moderately Rapid
Soil Runoff	Medium	Medium to Rapid	Rapid	Rapid	Medium	Mod. to Rapid
Erosion Hazard	Slight to Moderate.	Moderate	Moderate	Moderate	Moderate	Moderate
Equipment Limits	Moderate	Moderate	Moderate	Moderate	Slight	Moderate
Compaction Hazard	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
Slope Range	12 to 80%	12 to 50%	20to 50%	35-50%	5-35%	50 to 80%
Soil Reaction (Ph)	4.5 to 6.0	4.5 to 6.0	4.5 to 5.5	4.5-5.5	4.5-5.5	4.5 to 5.5
Preferred Species	White & Sh. Leaf Pine	Y.Poplar S.Leaf Pine White Pine N.Red Oak	Y.Poplar Wh.Pine N.Red Oak	Y.Poplar White Pine N.Red Oak	Y.Poplar N.Red Oak White Pine Hickory	Chestnut Oak, Pitch Pine

## Appendix B – List of Contributors

The following is a list of the persons who made contributions to the FEE.

Bob Harris – Team Leader (1998-2001) (Certified Silviculturist)  
Vern Maddux – Team Leader (2002) (Cert. Silv.) (Team Leader-NEPA)  
Marcia Carter – Team Member (Fisheries Biologist)  
Delce Dyer – Team Member (Landscape Architect)  
Joe McGuinness – Team Member (Wildlife Biologist)  
Amy Fore – Team Member (Team Leader-Resources)  
Tom Rowe – Team Member (Soil and Water Forester)  
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Mike Nicolo – Consultant (Forest Hydrologist)  
Bobby Scott – Consultant (Soil Scientist)  
Jim Stelick – Consultant (Team Leader-Vegetation Management)

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## Appendix D – Roads Analysis Process

## APPENDIX D

### Road Analysis for the Flatwoods Ecosystem Evaluation

#### INTRODUCTION

Roads analysis is an integrated ecological, social, and economical approach to transportation planning that addresses both existing and potential future roads (USFS, 1999a). This Roads analysis follows the process outlined in the document "Roads analysis: informing decisions about managing the National Forest transportation system (USFS, 1999a). This is not a NEPA document, but rather a site specific NFMA analysis for the Flatwoods Ecosystem Evaluation Area; approximately 12,956 acres of National Forest ownership within Compartments 105-115, and 117, which drain into the South Fork of the Holston River and South Holston Lake. This NFMA analysis defines the existing and desired conditions of the road system, and opportunities are identified to move towards the desired condition. This analysis provides a framework to identify road related concerns and management opportunities that can be incorporated into subsequent projects being evaluated through the NEPA process.

This analysis was done concurrently with the Flatwood Ecosystem Evaluation (FEE) and is attached to that document as an appendix.

FEE Interdisciplinary Team members are:

Vern Maddux (North Zone NEPA coordinator/Silviculturist)  
Bob Harris (Zone Silviculturist)  
Joe McGuinness (Zone Wildlife Biologist)  
Marcia Carter (Zone Fisheries Biologist)  
Mike Nicolo (Forest Hydrologist)  
Delce Dyer (Zone Landscape Architect)  
Amy Fore (Natural Resource Team Program Manager)  
Tom Rowe (Soil and Water Forester)

Consultants to the FEE team:

Quentin Bass (Forest Archaeologist)  
Gary Watson (Engineering Technician)  
Kathryne Atchinson (GIS Specialist)  
Roby Phillipi (District Fire Management Officer)  
Frank Lege (Special Use Forester)  
Bobby Scott (Forest Soil Scientist)

Individuals from this Interdisciplinary team were utilized for the Roads Analysis as needed. At critical points, Line Officers established sideboards, identified issues, and summarized management recommendations.

The Cherokee National Forest Land and Resource Management Plan (FLRMP, 1986) and amendments provide the management objectives, baseline information, and standards and guidelines to meet legal requirements. Additional information was obtained through field surveys, knowledge of forest personnel, and database queries. The analysis incorporates the best available scientific information as summarized in the document "Forest Service roads: a synthesis of scientific information" (USFS, 1999b). This information was the foundation for determining impacts to different resources and identifying recommended management actions.

### **EXISTING ROAD SYSTEM**

#### **Classified Roads (From Transportation Information System, *Attachment 1*)**

The primary access to the FEE area is provided by Forest Development Roads (FDR).#251 Hickory Tree, #87 Flatwoods, #87C Big Creek, and #87D Old Flatwoods. These roads are open year-round and designed for passenger cars.

FDR's #4202, 6112, 6113, 610803, 610820, 610901, 610902, 611101, and 61171 were constructed for timber management. FDR #61102 is under Special Use Permit to Bluff City for the Underwood Spring, and FDR #202C is under permit to the Federal Aviation Administration. Management levels are explained in *Attachment 2*. All of these roads are closed to maintain a road density of 0.71 miles per square mile.

The FEE area is within W-1 and W-2 Transportation Analysis Areas. W-2 is listed as Bear Sensitive in Amendment #16 of the FLRMP and has a desired density of 0.5 miles/sq. mile. The area does not meet the desired density because of the need to keep public access roads open for access to Little Oak Campground and South Holston Lake.

#### **Unclassified Roads**

Field inventories were conducted to find the unclassified roads in the FEE area. This inventory is in *Attachment 3*. From this inventory a grouping of the different types of unclassified roads was made. The groupings are explained in Attachment 4. The groupings of ABN: abandoned road receiving no vehicle use by the public, and TN: old temporary roads successfully closed and not receiving vehicle use by the public; will require no further discussion in this analysis. This leaves approximately 27 unclassified roads of varying lengths to consider. There are undoubtedly many more unclassified roads that cross the FS boundary from private lands that were not inventoried. These roads will almost always be OUT: unplanned roads serving no resource need. These roads that are not classified and are being used represent opportunities to decide on the future management of these roads; to block and reclaim them, or add to the classified system.

## **Desired Condition**

The desired condition is to provide a road system that is safe, responsive to public needs, meets the needs for forest management, is affordable, and has minimal ecological effects. Forest management needs are largely based on Forest Plan direction including management area prescriptions. Within the analysis area, recreation access is the primary public need.

## **ROAD RELATED ISSUES**

The following summarizes issues and concerns of specialists, managers, and the public related to the road system.

**Access for resource management and protection:** The road system is critical in utilizing timber harvest to meet wildlife management guidelines of early successional habitat. Roads provide access for fire control and insect and disease protection.

**Access for Special Use permittees:** Portions of the road system provide access to private land, powerlines, and electronic sites.

**Social and Recreational concerns:** Motorized recreation use is heavy in the FEE area. Roads provide access to South Holston Lake, Little Oak Campground, and for hunting, hiking and horse riding opportunities.

**Watershed Concerns:** The Road system should be reviewed for any possible effects to the watershed, and opportunities for improvement explored.

**Wildlife:** Transportation Analysis Unit W-2 is bear significant and presently does not meet the desired road density.

## **ASSESSMENT OF EFFECTS**

To Assess the effects of roads in the analysis area, the process described in Step 4 and Appendix 1 in "Roads Analysis: informing decisions about managing the National Forest transportation system" (USFS, 1999a) was used. The ID team discussed the 75 questions for their relevance to this analysis.

### **ECOSYSTEM FUNCTIONS AND PROCESSES (EF)**

EF1: What ecological attributes, particularly those unique to the region, would be affected by roading of currently unroaded areas?

**In many areas, the substrate consists of fragmented rock with relatively dense soils. Roading may increase runoff reaching into the subsurface flow. This may change subsurface flow patterns.**

**EF2: To what degree do the presence, type, and location of roads increase the introduction and spread of exotic plant and animal species, insects, diseases, and parasites? What are the potential effects of such introductions to plant and animal species and ecosystem function in the area?**

Exotic plants represent the greatest threats. Any additional roading would provide opportunities for existing exotic plants to spread. Most existing exotics in the area are associated with disturbance.

**EF3-4: How does the road system affect ecological disturbance regimes in the area? To what degree does the presence, type, and location of roads contribute to the control of insects, diseases, and parasites?**

Roads have increased the incidence of arson fires, but are also used as fire control lines, resulting in fire patterns governed by the location of roads. Roads could be used for insect and disease control, but this has not been needed in the past.

**EF5: What are the adverse effects of noise caused by developing, using, and maintaining roads?**

This is not considered a significant issue and was not raised during scoping. Within the analysis area the majority of traffic stems from private vehicles using the road system for recreational ventures. Heavy truck traffic is minimal and occurs only in conjunction with vegetation management and road maintenance. There are no communities within the analysis area that would be affected by noise from the road system.

#### **AQUATIC, RIPARIAN ZONE, AND WATER QUALITY (AQ)**

**AQ1: How and where does the road system modify the surface and subsurface hydrology of the area?**

The roads have three primary effects on hydrologic processes. They intercept rainfall directly on the road surface and cutbanks, and intercept subsurface water moving down the hillslope; they concentrate flow, either on the surface or in an adjacent ditch or channel; and they divert or re-route water flow flowpaths that it would otherwise take if the road were not present. Roads can affect peak streamflows depending upon the size of the watershed involved. In extreme cases they can capture or re-route water, dewatering a small stream. As a general rule, however, roads extend the drainage network of a watershed and result in quicker flood peaks. In large watersheds, roads constitute a small proportion of the land surface and have relatively insignificant effects on peak flow. Roads do not appear to alter annual water yields within a watershed.

Flatwoods road FDR #87 cuts laterally across Holston Mountain for considerable distance and intercepts subsurface flow.

**AQ2: How and where does the road system generate surface erosion?**

Gravel roads that cross streams (87, 87A, 87D, and 251) may generate a moderate amount of surface erosion, but do not create serious problems.

**AQ3: How and where does the road system affect mass wasting?**

There is no mass wasting in the analysis area.

**AQ4: How and where do road-stream crossings influence local stream channels and water quality?**

Stream crossings along 87, 87A, 87D, and 251, including culverts and bridges, influence stream channels directly upstream and downstream of the crossings, but impacts are slight.

**AQ5: How and where does the road system create potential for pollutants, such as chemical spills, oils, deicing salts, or herbicides, to enter surface waters?**

This is not an issue in the analysis area.

**AQ6: How and where is the road system "hydrologically connected" to the stream system? How do the connections affect water quality and quantity?**

Areas of concern for hydrologic connectivity and the effects to water quality and quantity have been identified in questions AQ 1, 2, and 4.

**AQ7: What downstream beneficial uses of water exist in the area? What changes in uses and demand are expected over time? How are they affected or put at risk by road-derived pollutants?**

Fishing and recreation in South Holston Lake are beneficial water uses downstream. Also, Underwood Springs supplies Bluff City with its water supply. No changes are expected. These uses are not threatened by road-derived pollutants.

**AQ8: How and where does the road system affect wetlands?**

No wetlands are known to occur.

**AQ9: How does the road system alter physical channel dynamics, including isolation of floodplains, constraints on channel migration, and the movement of large wood, fine organic matter, and sediment?**

The road along Big Arm Branch and Underwood Springs Branch Road may constrain channel migration. Roads 87, 87A, 87D, and 251 restrict the downstream movement of large wood, but this is not a big concern in these streams.

**AQ10: How and where does the road system restrict the migration and movement of aquatic organisms? What aquatic species are affected and to what extent?**

Culverts along 87, 87A, 87D and 251 may restrict the movement of rainbow trout, fantail darters, blacknose dace, and other aquatic organisms during times of low water.

**AQ11: How does the road system affect shading, litterfall, and riparian plant communities?**

No Effect

**AQ12: How and where does the road system contribute to fishing, poaching, or direct habitat loss for at-risk aquatic species?**

No Effect

**AQ13: How and where does the road system facilitate the introduction of non-native aquatic species?**

No concern

**AQ14: To what extent does the road system overlap with areas of exceptionally high aquatic diversity or productivity or areas containing rare or unique aquatic species or species of interest?**

Does not overlap

#### **TERRESTRIAL WILDLIFE (TW)**

**TW1: What are the direct effects of the road system on terrestrial species habitat?**

For smaller species of wildlife, such as salamanders, and invertebrates, roads can act as barriers to movement. Roads are the center of human disturbance. Species such as bear, bobcat, and turkeys tend to avoid these areas, during periods of human activity. However, closed roads are utilized as travel routes and hunting and foraging areas. Seeded roads are highly sought after in early spring as these are the first to green up. Water that collects in road ruts, is utilized by bats, frogs, salamanders, and other wildlife species.

**TW2: How does the road system facilitate human activities that affect habitat?**

The road system allows access for habitat management activities (timber harvest, prescribed burning, wildlife opening maintenance). It also serves as sites for illegal activities, such as garbage dumping, takeoff off places for off road driving, creating unclassified roads, and creating new dispersed campsites.

**TW3: How does the road system affect legal and illegal human activities? What are the effects on wildlife species?**

Roads provide means for humans to disperse throughout the area easily. Having a road system allows for greater utilization of the area for both legal and illegal activities. The greatest impacts to wildlife are from increased human disturbance.

**TW4: How does the road system directly affect unique communities or special features in the area?**

Currently, access on the road to Underwood Springs (Bluff City Water System) is unregulated. This has resulted in damage to the stream, a wetland, and surrounding forested habitat. Flatwoods road may impact the quality of the water due to the geology of the area. Sections have been paved, and an ATV trail closed which seems to have improved the situation.

#### **ECONOMICS (EC)**

**EC (1): How does the road system affect the agency's direct costs and revenues? What, if any, changes in the road system will increase net revenue to the agency by reducing cost, increasing revenue, or both?**

This analysis would be completed as part of individual project EA/EIS, if raised as an issue during scoping.

**EC (2): How does the road system affect the priced and non-priced consequences included in economic efficiency analysis used to assess net benefits to society?**

This analysis would be completed as part of individual project EA/EIS, if raised as an issue during scoping.

**EC (3): How does the road system affect the distribution of benefits and costs among affected people?**

This analysis would be completed as part of individual project EA/EIS, if raised as an issue during scoping.

#### **COMMODITY PRODUCTION (TM, MM, RM)**

##### **Timber Management**

**TM 1,2,3: How does the road spacing and location affect logging system feasibility? How does the road system affect managing the suitable timber base and other lands? How does the road system affect access to timber stands needing silvicultural treatment?**

Transportation planning has been a key component of timber sale planning in this area. Most of the transportation network has been built for and through timber sales so the system serves the timber resource well. Planning has considered future needs as well as immediate sale needs. Future timber sales may require the use of temporary roads, but new classified roads are not expected.

### **Minerals Management**

#### **MM 1: How does the road system affect access to locatable, leasable, and salable minerals?**

There are no locatable, leaseable, or salable mineral claims in the analysis area.

### **Range Management**

#### **RM 1: How does the road system affect access to range allotments?**

There are no range allotments in the analysis area.

### **WATER PRODUCTION (WP)**

#### **WP1-3: How does the road system affect access, constructing, maintaining, monitoring, and operating water diversions, impoundments, and distribution canals or pipes, municipal watersheds, or hydroelectric projects?**

There is a road to the Bluff City Underwood Spring. There are other roads in this vicinity, some of them provide access to private land. These may contribute to turbidity problems at Underwood Spring. None of these roads are classified system roads.

### **SPECIAL FOREST PRODUCTS (SP)**

#### **SP 1: How does the road system affect access for collecting special forest products?**

There are a few permits let for Ginseng gathering and firewood. The classified road system is adequate to meet demand for special forest products in this area.

### **SPECIAL USE PERMITS (SU)**

#### **SU 1: How does the road system affect managing special-use permit sites (concessionaires, communications sites, utility corridors, and so on)?**

Inventoried roads SUP01-04 provide access to private lands and electric transmission line rights-of-way. None of these roads are currently classified system roads. FDR #202C is under special use permit to the Federal Aviation Administration, and FDR #61102 is under permit to Bluff City for the Underwood Spring.

#### GENERAL PUBLIC TRANSPORTATION (GT)

**GT(1): How does the road system connect to public roads and provide primary access to communities?**

Primary accesses into and out of the analysis area for recreation, F.S. administration, commodity production, and access to special use communications sites is provided by U.S. Hwy 19E, U.S. 421, State Hwy 44, and FDR 87, FDR 251, FDR 56 and FDR 202. Forest development road #87 runs west to east through the analysis area, with FDR 202 running along the eastern edge of the analysis area. There are 2 city's Bluff City, and Elizabethton and other small communities around the analysis area. There are state and county roads providing access between these communities. The primary purpose for the Forest Service Roads in the analysis area is to provide access for resource management.

**GT(2): How does the road system connect large blocks of land in other ownership to public roads?**

The Forest Service Road system in the analysis area has no affect on the connecting lands in other ownership.

**GT(3): How does the road system affect managing roads with shared ownership or with limited jurisdiction? (RS2477, cost share, prescriptive rights, FLPMA easements, FRTA easements, DOT easements)**

There are some roads within the analysis area that are maintained by other public road agencies and by others, (Utility companies). The utility companies perform maintenance needed for the roads they use to access their facilities.

**GT(4): How does the road system address the safety of road users?**

The forest service roads in the analysis area are maintained and signed in accordance with their maintenance and traffic service levels and are considered adequate for use under normal operating conditions. Any management activity, which increases use or considerably alters normal traffic use, should be mitigated. Additional road maintenance may be required to safely accommodate heavier volume.

#### ADMINISTRATIVE USE (AU)

**AU 1: How does the road system affect access needed for research, inventory, and monitoring?**

The current road system has been utilized recently for bird, salamander, butterfly, and botanical surveys.

**AU2: How does the road system affect investigative or enforcement activities?**

The road provides opportunities for road blocks, drop-off points, surveillance activities, and patrolling. The existence of the road creates the need for more law enforcement.

**PROTECTION (PT)**

**PT 1-3: How does the road system affect fuels managements? How does the road system affect the capacity of the Forest Service and cooperators to suppress wildfires? How does the road system affect risk to firefighters and to public safety?**

Roads, both classified and unclassified are often used as firebreaks and control lines for prescribed burns and wildfire control. Roads can also be used by arsonists to set fires. Most roads are adequate for firefighting equipment to travel on. Closed and gated classified roads may need minimal dozer work to utilize for equipment movement.

**PT 4: How does the road system contribute to airborne dust emission resulting in reduced visibility and human health concerns?**

Flatwoods road and other open roads do get dusty, but traffic is generally light enough for it not to be a major visibility hazard

**RECREATION (UR, RR)**

**Unroaded Recreation (UR)**

**UR 1-5: Is there now or will there be in the future excess supply or excess demand for unroaded recreation opportunities? Is developing new roads into unroaded areas, decommissioning of existing roads, or changing the maintenance of existing roads causing substantial changes in the quantity, quality, or type of unroaded recreation opportunities? What are the adverse effects of noise and other disturbances caused by developing, using, and maintaining, on the quantity, quality, and type of unroaded recreation opportunities? Who participates in unroaded recreation in the areas affected by constructing, maintaining, and decommissioning roads? What are these participants' attachments to the area, how strong are their feelings, and are alternative opportunities and locations available?**

These are Forest level Questions.

## **Road-Related Recreation (RR)**

**RR 1, 3-5: Is there now or will there be in the future excess supply or excess demand for roaded recreation opportunities? What are the adverse effects of noise and other disturbances caused by constructing, using, and maintaining roads on the quantity, quality, or type of roaded recreation opportunities? Who participates in roaded recreation in the areas affected by road construction, changes in road maintenance, or road decommissioning? What are these participants' attachments to the area, how strong are their feelings, and are alternative opportunities and locations available?**

These are Forest level questions?

RR2: Is developing new roads into unroaded areas, decommissioning of existing roads, or changing maintenance of existing roads causing substantial changes in the quantity, quality, or type of roaded recreation opportunities?

There is not expected to be any large scale new road development or closing of existing roads with any management plans now being considered for the Flatwoods, so no substantial changes are foreseen.

## **PASSIVE USE VALUE, SOCIAL ISSUES, CIVIL RIGHTS, AND ENVIRONMENTAL JUSTICE (PV, SI, CR)**

**PV 1-4, SI 1-10, and CR1: What are people's perceived needs and values for access? How does road management affect people's dependence on, need for, and desire for access?**

The primary social demand for roads in the analysis area is access for hunting, dispersed campsites adjacent to the road system.

The road system is used by all groups of people. Changes in road management including closing or decommissioning of any of the roads would have the same effect on all groups of people including minorities and different cultures.

## **ROAD RELATED OPPORTUNITIES**

The team reviewed the road inventory grouping in *Attachment 4* and makes the following recommendations:

*Paving:*

FDR #87 (Flatwoods Road) From Hickory Tree to State Highway 421 (Beyond FEE area)

*Gate:*

Work out agreement to gate FDR #61102 to Bluff City Special Use (Underwood Spring).  
There are access concerns with private landowners.

*Tank trap and obliterate:*

TU01	TU02	TU03	TU04
TU05	TU06	TU08	TU09
OUT01	OUT02	OUT04	OUT05
OUT06			
ABU01	ABU02	ABU03	ABU04
ABU05			

*Add as a classified road with gate closed:*

WL01	WLO2	WLO3	WLO4
SUP01	SUP02	SUP03	SUP04

TU10 (Tank trap to prevent go-arounds)

*Remove from inventory:*

These have now been determined to be only primitive campsites.

TU07      OUT03

*Add to inventory:*

Roads in Underwood Springs area: Close all extraneous roads possibly contributing to turbidity problems. Access to private lands is a concern.

*Uninventoried roads:*

Any other roads discovered, especially coming into National Forest lands from private lands will most likely be Outlaw roads (OUT) and should be closed and obliterated as found.

*Roads needing Erosion Control Projects:*

TN12      SUP02

## **CONCLUSION**

The existing classified road system plays a vital role in the facilitation of forest management and providing access for public needs. The key opportunities identified in this analysis include improving the overall situation by closing unclassified roads not needed for resource management and to pave the Flatwoods road to provide a higher level of service to the recreating public.

## **REFERENCES**

USFS 1999a: Roads Analysis: informing decisions about managing the National Forest Transportation System. USDA Forest Service Washington Office FS-643, August 1999.

USDA Forest Service. 1986. Final Land and Resource Management Plan for the Cherokee National Forest. Cleveland, Tennessee.

**Attachment 1: Transportation Information System printout**

**Attachment 2: Watauga Ranger District Road Management Plan**

**Attachment 3: Flatwoods Road Inventory**

**Attachment 4: Flatwoods Road Grouping**

**Attachment 5: Transportation Map**

ROUTE IDENTIFICATION										LOCATION										CHARACTERISTICS/MANAGEMENT										MAINTS	
ROAD NO	ROUTE NAME	ST	RD	CO	MP	...	TERMINI	MAP	INDX	LENGTH	DS	FC	SYS	SL	TSL	RPA	JUR	SUR	LA	REG	PMT	PM	OML								
166	JUCK RIDGE TOWER	NC	06	011	0.00		NC. CR.	36158152		0.42	EX	L	PD	I	D	I	PO	NAT	1	R	N	PO	2								
		TN	06	019	0.42		TN.ST.LINE	36158152		0.88	EX	L	FDR	I	D	I	FS	NAT	1	R	N	PO	1								
		TN	06	019	1.30		DE.TOWER			0.00														0							
202	HOLSTON MOUNTAIN	TN	06	163	0.00		FDR 56	36228200		1.07	EX	L	FDR	C	C	L	FS	IMP	1	R	N	FS	3								
202	HOLSTON MOUNTIAN	TN	06	163	0.30		SITE # ?	36228200		0.77	EX	L	FDR	C	D	L	FS	AGG	1	R	N	FS	3								
202	HOLSTON MOUNTAIN	TN	06	163	1.07		FDR 4071 LT.	36228200		0.50	EX	L	FDR	C	C	L	FS	IMP	1	R	N	FS	3								
		TN	06	163	1.57		FDR 2028 LT.	36228200		0.03	EX	L	FDR	C	C	L	FS	IMP	1	R	N	FS	3								
		TN	06	163	1.60		TN HWY PATROL RT	36228200		0.40	EX	L	FDR	C	C	L	FS	IMP	1	R	N	FS	3								
		TN	06	163	2.00		MEMORIAL LT	36228200		0.10	EX	L	FDR	C	C	L	FS	IMP	1	R	N	FS	3								
		TN	06	163	2.10		FDR 202C RT - FAA VOR	36228200		0.66	EX	L	FDR	C	C	L	FS	IMP	1	R	N	FS	3								
		TN	06	163	2.76		LOW GAP	36228200		0.74	EX	L	FDR	C	C	L	FS	IMP	1	R	N	FS	3								
		TN	06	163	3.50		WEATHER RT	36228200		0.50	EX	L	FDR	C	C	L	FS	IMP	1	R	N	FS	3								
		TN	06	163	4.00		TV.TWR-FDR 202A	36228207		0.00															0						
202A	LITTLE STONY	TN	06	163	0.00		FDR 202	36228207		5.00	EX	L	FDR	C	D	E	FS	NAT	1	D	N	FS	2								
		TN	06	163	5.00		CH	36228207		1.00	EX	L	C	C	D	E	C	AGG	1	D	N	C	2								
		TN	06	163	6.00		TN91			0.00														0							
202B	TV 5	TN	06	019	0.00		FDR 202	36228200		0.13	EX	L	FDR	C	D	L	FS	AGG	1	R	N	PO	3								
		TN	06	019	0.13		DE.			0.00														0							
202C	FAA VOR	TN	06	163	0.00		FDR 202	36228200		0.35	EX	L	FDR	C	D	L	FS	IMP	1	R	U	DF	3								
		TN	06	163	0.35		DE @ BLDG	36228200		0.00														0							
204	SPILLWAY	TN	06	163	0.00		SD HOLSTON DAM	36308200		3.00	EX	L	OP	I	C	L	OF	IMP	1	R	N	DF	2								
		TN	06	163	3.00		DE.			0.00														0							
250	HICKORY TREF	TN	06	163	0.00		FDR 87	36228200		0.95	EX	C	FDR	C	D	L	FS	AGG	2	D	N	FS	4								
		TN	06	163	0.95		CH2649	36228207		0.00														0							
2697	MC QUEEN BRANCH	TN	06	091	0.00		CH2696	36308152		0.08	EX	L	C	C	C	L	C	BIT	1	D	N	C	4								
		TN	06	091	0.08		BRIDGE (3 FON)	36308152		0.31	EX	L	C	C	C	L	C	BIT	1	D	N	C	4								
		TN	06	091	0.39		CULVERT 10FT STA	36308152		0.22	EX	L	C	C	C	L	C	BIT	1	D	N	C	4								
		TN	06	091	0.61		BRIDGE	36308152		0.11	EX	L	C	C	C	L	C	BIT	1	D	N	C	4								
		TN	06	091	0.72		FDR 20203 RT	36308152		0.04	EX	L	C	C	C	L	C	BIT	1	D	N	C	4								
		TN	06	091	0.76		SURFACE CHANGE	36308152		0.32	EX	L	C	C	D	L	C	IMP	1	D	N	C	3								





12.02  
0.37  
55  
HEROKEE NF

USDA (Forest Service)  
Transportation Information System  
Road Management Sections (R1)

ROUTE IDENTIFICATION		LOCATION				CHARACTERISTICS/MANAGEMENT											MAINTS					
ROAD NO	ROUTE NAME	ST	RD	CG	MP	TERMINI	MAP	INDX	LENGTH	DS	FC	SYS	SL	TSL	RPA	JUR	SUR	LA	REG	PMT	PM	OML
87	FLATWOODS	TN	06	163	9.84	FDR 87D RT.	36228200		3.03	EX	C	FDR	C	B	L	FS	AGG	2	O	N	FS	4
		TN	06	163	12.87	FS GATE	36228200		0.04	EX	C	FDR	C	B	L	FS	AGG	2	O	N	FS	4
		TN	06	163	12.91	FDR 87D RT.	36228200		0.01	EX	C	FDR	C	B	L	FS	AGG	2	O	N	FS	4
		TN	06	163	12.92	FDR 251 RT.	36228200		0.19	EX	C	FDR	C	C	L	FS	AGG	2	O	N	FS	4
		TN	06	163	13.11	FDR 610820 LT.	36228200		0.29	EX	C	FDR	C	C	L	FS	AGG	1	O	N	FS	3
		TN	06	163	13.40	MORRELL TRAIL	36228200		0.30	EX	C	FDR	C	C	L	FS	AGG	1	O	N	FS	3
		TN	06	163	13.70	FDR 610803 LT.	36228200		1.10	EX	C	FDR	C	C	L	FS	AGG	1	O	N	FS	3
		TN	06	163	14.80	FDR 610901 LT.	36228200		0.50	EX	C	FDR	C	C	L	FS	AGG	1	O	N	FS	3
		TN	06	163	15.30	FDR 610902 LT.	36228200		2.73	EX	C	FDR	C	C	L	FS	AGG	1	O	N	FS	3
		TN	06	163	18.03	FDT 43 LT.	36228207		0.04	EX	C	FDR	C	C	L	FS	AGG	1	O	N	FS	3
		TN	06	163	18.07	WATER ROAD RT.	36228207		0.23	EX	C	FDR	C	C	L	FS	AGG	1	O	N	FS	3
		TN	06	163	18.30	ATV PARKING	36228200		0.34	EX	C	FDR	C	C	L	FS	AGG	1	O	N	FS	3
		TN	06	163	18.64	FDR 611101 LT.	36228207		0.64	EX	C	FDR	C	C	L	FS	AGG	1	O	N	FS	3
		TN	06	163	19.28	TRAIL LT.	36338207		0.10	EX	C	FDR	C	C	L	FS	AGG	1	O	N	FS	3
		TN	06	163	19.38	FDR 87L RT.	36228207		0.78	EX	C	FDR	C	C	L	FS	AGG	1	O	N	FS	3
		TN	06	163	20.14	CULVERT	36228207		0.16	EX	C	FDR	C	C	L	FS	AGG	1	O	N	FS	3
		TN	06	163	20.32	CULVERT	36228207		0.34	EX	C	FDR	C	C	L	FS	AGG	1	O	N	FS	3
		TN	06	163	20.66	CULVERT	36228207		0.06	EX	C	FDR	C	C	L	FS	AGG	1	O	N	FS	3
		TN	06	163	20.72	FDT 43 LT.	36228207		1.20	EX	C	FDR	C	C	L	FS	AGG	1	O	N	FS	3
		TN	06	163	21.92	CULVERT	36228207		0.08	EX	C	FDR	C	C	L	FS	AGG	1	O	N	FS	3
		TN	06	163	22.00	FDR 6112 RT.	36228207		0.18	EX	C	FDR	C	C	L	FS	AGG	1	O	N	FS	3
		TN	06	163	22.18	CULVERT	36228207		0.12	EX	C	FDR	C	C	L	PD	AGG	1	O	N	FS	3
		TN	06	163	22.30	BEGIN PAVEMENT	36228207		0.01	EX	C	C	C	C	L	C	BIT	1	O	N	C	4
TN	06	163	22.31	COUNTY RD. RT.	36228207		1.83	EX	C	C	C	C	L	C	BIT	1	O	N	C	4		
TN	06	019	24.14	COUNTY RD. RT.	36228207		0.70	EX	C	C	C	C	L	C	BIT	1	O	N	C	4		
TN	06	019	24.94	COUNTY RD. LT.	36228207		0.12	EX	C	C	C	C	L	C	BIT	2	O	N	C	4		
TN	06	019	24.96	US19E				0.00													0	
87A	FISHDAM SE.	TN	06	163	0.00	FDR 87	36228200		3.90	EX	L	FDR	I	D	E	FS	AGG	1	R	N	FS	2
		TN	06	163	3.90	DE. 1.90 GATE	36308200		0.00													0
87B	FISHDAM NE.	TN	06	163	0.00	FDR 87	36308200		5.30	EX	L	FDR	I	D	E	FS	AGG	1	R	N	FS	2
		TN	06	163	5.30	DE. 1.80 GATE			0.00													0
87C	BIG CREEK	TN	06	163	0.00	FDR 87D	36228200		0.29	EX	L	FDR	C	D	A	FS	AGG	1	R	N	FS	2
		TN	06	163	0.29	DE. LAKE			0.00													0
87D	OLD FLATWOODS	TN	06	163	0.00	FDR 87	36228200		0.87	EX	L	FDR	C	C	E	FS	AGG	1	O	N	FS	3
		TN	06	163	0.87	FDR 87C RT.	36228200		0.02	EX	L	FDR	C	C	E	FS	AGG	1	O	N	FS	3
		TN	06	163	0.89	FDR 87C RT.	36228200		0.15	EX	L	FDR	C	C	E	FS	AGG	1	O	N	FS	3
		TN	06	163	1.04	CULVERT	36228200		0.37	EX	L	FDR	C	C	E	FS	AGG	1	O	N	FS	3
		TN	06	163	1.41	CULVERT	36228200		0.35	EX	L	FDR	C	C	E	FS	AGG	1	O	N	FS	3
		TN	06	163	1.76	ROARING FORK CULVERT	36228200		0.76	EX	L	FDR	C	C	E	FS	AGG	1	O	N	FS	3
		TN	06	163	2.52	POWERLINE	36228200		0.95	EX	L	FDR	C	C	E	FS	AGG	1	O	N	FS	3

FDR 6065 H



Attachment 2

File Code: 7700  
Route To:

Date: May 18, 2001

Subject: Watauga Ranger District Road Management Plan

To: Forest Supervisor

This letter is to document that the district roads by Road Management Objective (RMO) and Maintenance Level (ML) dated May 2001, serve as the Road Management Plan for the Watauga Ranger District. Key district personnel have coordinated with North Zone Engineer, Jan Edwards to update these lists. This plan provides a direct link between the wording in some of our closure orders and the effectiveness of our Law Enforcement Officers enforcing those closures.

A hardcopy of the summary of roads and the district lists will be forthcoming.

/s/ Candace W. Allen  
CANDACE W. ALLEN  
District Ranger

Cc: Terry Smith  
Kim Coleman  
Amy Fore



*DISTRICT ROADS by RMO,ML*

*May 2001*

*Page 1 of 2*

*Watauga*

*A5 – passenger car comfort; usually paved; dust free  
Repair surface damage asap; mow every year; maintain signs & markings  
Repave 10 to 12 years*

* 251	Hickory Tree	0.95
292	Watauga Point	0.50
292A	“ “ entrance parking	0.05
292B	“ “ loop parking	0.10
295	Backbone Rock Day Use	0.40
295A	“ “ Hiking parking	0.10
295B	“ “ Camping loop	0.20
296	Shook Branch	0.30
298	Sink Mt	2.21
329	Cardens Bluff	0.77
329A	“ “ Loop	0.34
329B	“ “ spur	0.09
329C	“ “ host	0.04
337	Jacobs Cr Rec	1.36
337A	“ “ “ Loop A	0.12
337B	“ “ “ Loop B	0.13
337C	“ “ “ Loop C	0.21
344	Little Pond Shooting	0.20
360	Watauga Work Center	0.10
362	Laurels Rec	0.11
4034	Jacobs Creek Job Corps	0.60
4034A	“ “ “ “ Admin	0.36
4034B	“ “ Residence	0.14
4034C	“ “ Residence	0.10
499	Y’s Men	0.20
50 B	Dennis Cove Rec	0.20
50BA	“ “ Camping	0.15
5306	Hampton trailhead Parking	0.10
53571	Scioto Rifle Range	0.12

60972	Jacobs Cr Shooting	0.15
6030	Moretz L.Milligan	0.53
6303	Rat Branch	0.30
* 87	Flatwoods US 421 to Hickory Tree	12.54
* 87G	Little Oak	2.40
87GA - GI		1.34
--	Dennis Cove AT parking	0.01
		<hr/>
	Total	27.52

**\* Potential Public Forest Service Road (PFSR)**

*DISTRICT ROADS by RMO, ML*

May 2001

page 1 of 1

*Watauga*

*B4 - passenger car convenience*

*Repair resource damage asap; surface blade 3/yr; drainage 1/yr; mow every year ;  
smooth surface, min. 6" aggregate; maintain signs.*

123	Gentry Cr	0.20	have r/w WL
123A	Old Gentry Cr	0.15	
* 202	Holston Mt	4.0	
202B	WCYB 5 TV	0.13	special use
298	SINK MT	2.21	
* 39	Little Stony	5.10	
* 50	Laurel Fork	4.95	
50F	Frog Level	2.25	
* 56	MILL CREEK	3.50	

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Total 22.49 miles

\* Potential Public Forest Service Road (PFSR)

*DISTRICT ROADS By RMO, ML*

May 2001

Page 1 of 1

*Watauga*

*C3 - Standard passenger car*

*Resource damage repaired asp; surface blade 2/yr; drainage 1/yr: min. 4" aggregate.  
Mow every year; maintain signs.*

123	Gentry Cr	1.1	
293	Bitter End Lacy Trap 1 <sup>st</sup> seg.	2.65	
* 32	DENTON VALLEY	5.63	SOWBED GAP SEG.
* 32	" " "	1.80	STATELINE SEG.
359	Little Mt	0.25	have r/w
4034	JCCC STORAGE SEG - II	0.11	
50A	Cherry Flats	1.38	
5081	GRIFFITH BRANCH - I	0.20	have r/w
* 53	CROSS MT	2.85	
* 69	MCQUEEN	6.55	
* 87	FLATWOODS-KEENBURG	9.4	
87C	Big Cr	0.29	
* 87D	OLD FLATWOODS	4.44	

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Total 36.65 miles

- Potential Public Forest Service Road (PFSR)

**DISTRICT ROADS BY RMO, ML**

May 2001

page 1 of 4

**Watauga**

**D2 – Repair resource damage: No scheduled blading, drainage, surface work.**

**HC – High clearance vehicles:**

Mow every 5 yrs

**FS – Administrative uses**

Mow every 3 yrs; Access is limited

**WL- Linear wildlife opening**

Mow every yr; Access is limited

1206	BEE SUCK	0.3	FS
1206A	BEE SUCK SPUR	0.2	FS
123	Gentry Cr	1.4	HC
124	WHETSTONE	0.55	FS have r/w
202A	LITTLE STONY	5.0	HC No r/w @ bottom?
202C	FAA VOR ???	0.35	FS SPECIAL USE
204	SPILLWAY TVA	3.00	FS special use TVA?
2697	McQueen Br	0.36	Access private
293	Bitter End Lacy trap 2 <sup>nd</sup> seg.	1.70	FS
293	“ “ “ 3 <sup>rd</sup> seg.	5.80	WL
293A	Cedar Gap	1.0	WL
293B	Big Flats	1.50	FS
293C	“ “ Br.	0.40	FS access private
293D	Oak Road	0.91	WL
303	Wagner Br	6.14	WL
313	Irishman Br	3.15	FS
322	SUTHERLAND TRAIL	2.4	HC
359	Little Mt 2 <sup>nd</sup> seg.	3.57	FS
359A	“ “ Spur 1 <sup>st</sup> seg.	0.28	HC
376	LUNSFORD HOLLOW	0.06	FS
4002	PINE MT	5.37	FS
4034E	JCCC TRAINING	0.10	FS
4052	ROBBINS HOLLOW	8.10	FS
41231	Moody Airstrip	0.55	WL
4202	Flint Mill Gap	3.00	WL
4315	Canute Fields	0.40	WL
4431	DOGWOOD BENCH	7.63	FS

4441	DYE LEAF	0.85	FS Have r/w
"	" " SPUR	0.40	FS
4442	AVERY BRANCH	0.45	FS have r/w
47	Rockhouse Run	2.50	WL
50A	Cherry Flats 2 <sup>nd</sup> seg.	0.74	WL
50G	Stocking Access	0.20	WL
5081	GRIFFITH BRANCH 2 <sup>nd</sup> section	4.78	FS have r/w
51	Bley Special Use	0.19	FS PO
53A	Blackburn	1.06	FS
530101	Campbell Tract	0.30	FS cemetery access
53011	Hays Br	0.26	WL
530112	Cherry Flats Spur	1.00	WL
530113	" " "	0.50	WL
530211	" " "	0.76	WL
530214	" " "	0.81	WL
53023	Camp Ten Br	0.25	WL
5310	Gap Cr	1.20	FS
53102	Jenkins MT	2.32	FS
5311	Gum Hollow	1.14	FS
5314	Laurel Mt. - White Rocks	3.77	HC
531601	S. Leonard Br	0.19	WL
531602	Lacy Trap Ridge	2.01	WL
531701	E Moreland Br	0.19	WL
531801	Upper Laurel Cr	0.40	WL
531901	Johnson Tract	0.50	WL
53351	Piney Grove Rt	3.22	WL
53352	" " Lt	1.00	WL

5337	Dry Cr-Lyons Cemetery	0.10	FS have r/w
533801	Powder Br	1.95	HC
5340	Honeycomb	0.72	HC have r/w
53481	Ledford #1	0.70	PO
53482	" #2	0.10	PO
540902	Belcher Tract	1.04	r/w?
56A	Holston High Knob	1.20	FS
60011	Buckeye Br- VA	0.27	PO no r/w
60011-1	" " - TN	0.33	PO r/w?
60031	Piney Knob Ridge	2.00	FS
60032	Seng Cove Bishop Road	1.00	County & PO
60033	" " Spur	0.50	PO
60061	Bald Knob	3.50	HC
6010	Valley Forge	0.87	FS
60111	Lyons Br.	2.26	FS
60111A	" " Spur	0.75	FS
6015	Stout Br	1.52	FS
60151	" " Spur	0.98	FS
60162	Polly Branch TVA	0.15	OF
60191	Campbell Hollow	3.00	WL
602101	Gouge Tract	0.60	FS
6031	Row Branch	2.00	FS no r/w?
60341	Black Br	0.85	FS private access
6037	Asher Br	0.10	FS have r/w
6038	Elk River	3.47	FS TN & NC NFs
60391	Gregg Br	0.76	FS private access
6044	Neely	1.70	FS
60451	Chalk Br	1.50	WL
6048	Birch Br	0.83	WL
6049	Parks Br	2.04	FS Have r/w
6054	Shady Gap	1.80	FS
60551	Lindy Camp	2.85	WL
6059	Grindstaff Br	0.60	WL
6059A	" Spur	0.50	WL
60591	Elliott Hollow	0.60	WL

6065	Lock Ridge	3.97	FS r/w problem
60681	Hinkle Br Powerline	1.60	FS
60682	Furnace Br	2.00	FS
6073	Rt Fork Mill Cr	0.50	FS
6079	Barry Tract	2.73	FS
60802	Lower Heberlain	1.67	FS
60803	McQueen Br Spur	0.38	FS access private
60804	Gentry Br	1.05	FS
6083	Dark Hollow	1.50	FS
60851	Beaverdam	0.14	HC
60852	Stillhouse Spur	0.1	WL
6089	Swanagan Mt	0.79	WL
6091	Sowbed Gap	1.20	WL
60921	McClain	0.90	WL
6098	Snake Spur	2.52	WL
6099	Camp Tom Howard	1.31	WL
611101	Keener Spur	0.30	WL
611102	Underwood Springs	0.57	FS access private
6112	Big Arm Wood-Cove Ridge Rd	1.00	WL
6113	Miller Br	0.44	FS access private
61192	Sharps Ridge	1.06	WL
61193	Sharps Cr	0.64	WL
6491	Parks-Birch	2.78	FS
69B	Marshall Br	3.34	WL
71-2	White Rock Tower	1.10	HC
87A	Fishdam SE	3.90	FS
87B	Fishdam NE	5.30	FS
Total		180.14	miles

**DISTRICT ROADS BY RMO, ML**

*May 2001*

*page 1 of 2*

*Watauga*

**DI- CLOSED TO ALL VEHICLES**

1206	Bee Suck 2 <sup>nd</sup> Seg.	1.20
123B	GENTRY CR EXT	0.68
123C	CUT LAUREL RR.	0.75
124	WHETSTONE 2 <sup>nd</sup> section	1.85
300	Tank Hollow/ Iron Mt	3.71
301	OLD 421 HWY	1.20
3020	CAMP HOLLOW	1.5
3042	Flat Ridge	1.45
313A	Irishman Br Spur	0.65
316	BARTEE BRANCH	2.20
316A	SAMS COVE	1.0
359A	Little Mt Spur 2 <sup>nd</sup> seg.	0.92
4052A	GRINDSTONE RIDGE	1.00
4071	RYE PATCH	2.60
53024	Lower Cherry Flats	0.46
53031	Lower Bunton	1.14
5314A	Laurel Mt Spur	0.34
531501	Lacy Trap Spur	0.34
531603	Bear Cove Ridge	1.35
531702	Moreland Gap	0.87
53354	East stone Mt	0.35
533802	Powder Br Spur	1.20
60161	MACK BRANCH	1.42
60202	CRESS BRANCH	0.70 have r/w nearby.
60301	WHALEYTOWN	2.47
60302	FISH SPRINGS	1.14
6034	LITTLE POND MT	3.18
6034A	MAYS RIDGE	0.21
6036	FLINT RIDGE	0.83
60361	VANDERPOOL RIDGE	1.00
6053	JIM WRIGHT BR	2.50
6054	Shady Gap 2 <sup>nd</sup> seg.	0.95
6054A	MID FORK BEAVERDAM	1.36

60801	Upper HEBERLAIN	0.72	
60804	GENTRY BR - II	0.17	
60806	HEBERLAIN SPUR	0.54	
60832	DARK HOL LT FORK	0.61	
60833	LOWER DARK HOL	0.30	
60851	BEAVERDAM - II	2.55	
60852	Stillhouse Br Spur	0.09	
6090	WHEELER SPUR	1.00	
60902	BROWNIE	0.47	
60962	L. JACOBS CR	0.40	
60971	PADDYS' BR RIDGE	1.49	
60971A	" " " SPUR	1.82	
60973	MIDDLE RIDGE	0.70	
60975	STRAIGHT CR	0.38	
610801	OLD SPRING RD	0.09	
610803	Little Br. Road	0.37	
610901	UP HATCHER CR	0.67	
610902	LOW GAP BR	0.27	
61171	BIG CR RIDGE	0.26	
61201	NETTIE HILL	0.50	
61202	" " SPUR	0.40	
6121	HARR ROAD	1.00	HAZ SITE
6500	MARRIAGE GROUND	0.63	
6501	GRAVEYARD RIDGE	0.53	
6502	FLAT SPRING	0.12	
87F	NORTH FISHDAM	0.74	
87H	LAKE ACCESS - II	1.14	
87J	JOSIAH CREEK	0.30	
87L	GIRL SCOUT	0.35	now private

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Total 60.13 miles

251

**ROAD MANAGEMENT OBJECTIVE**  
**Cherokee National Forest**  
**A5**

05/21/99

**Intended Purpose of Road**

The purpose of this road is to provide access for various resource activities . The road is open to public traffic in standard 4-wheel passenger cars and, thus, is subject to the Highway Safety Act. User convenience is more of a concern than for TSL C roads. Usually paved. Road may be closed seasonally or for periods of freeze-thaw conditions.

**Design, Operation and Maintenance Criteria**

Traffic Service Level	A
Maintenance Level	5
Functional Classification	Arterial (or collector or local)
Traffic Volume	Moderate - High
Traffic Classification	Timber Low%, Recreation high%, Administrative low%
Traffic Management	Open to all legal traffic (commercial traffic by permit only)
Environmental Consideration	May or may not be adjacent to streams and/or have erosive soils
Design Vehicle	
<ul style="list-style-type: none"> <li>•For curve widening</li> <li>•For surfacing</li> <li>•For grade</li> <li>•For travel way width</li> <li>•For sight distance</li> </ul>	<ul style="list-style-type: none"> <li>•Generally tractor trailer</li> <li>•Same</li> <li>•Same</li> <li>•Same</li> <li>•Pickup/SUV</li> </ul>
Critical Vehicle	Low boy
Subject to Highway Safety Act	Yes

**Design, Operation and Maintenance Standards**

Width	Generally 18 feet plus curve widening
Turnouts	N/A
Surfacing	Paved
ADT	Moderate - High
Design Speed	10 - 15 mph
Highway Safety Act	Signed to meet MUTCD
Maintenance Level 5 requirements	<ul style="list-style-type: none"> <li>•Do annual inspection (condition survey)</li> <li>•Make repairs as soon as need is recognized</li> <li>•Pavement repairs as needed; ditches/culvert inlets cleaned annually</li> <li>•Clear out blowdown as it occurs and mow every year to maintain safe sight distance</li> <li>•Repave on a 10-12 year cycle)</li> <li>•Maintain signs and other safety considerations</li> </ul>

Recommended:

Date:

Approved:

District Ranger

Date:

87, 87C, 87D

**ROAD MANAGEMENT OBJECTIVE**  
**Cherokee National Forest**  
**C3**

05/21/99

**Intended Purpose of Road**

The purpose of this road is to provide access for various resource activities . The road is open to public traffic in standard 4-wheel passenger cars and, thus, is subject to the Highway Safety Act. Road may be closed seasonally or for periods of freeze-thaw conditions.

**Design, Operation and Maintenance Criteria**

Traffic Service Level	C
Maintenance Level	3 (or 4)
Functional Classification	Collector
Traffic Volume	Moderate - High
Traffic Classification	Timber Moderate%, Recreation high%, Administrative low%
Traffic Management	Open to all legal traffic (commercial traffic by permit only)
Environmental Consideration	May or may not be adjacent to streams and/or have erosive soils
Design Vehicle	
•For curve widening	•Generally tractor trailer
•For surfacing	•Same
•For grade	•Same
•For travel way width	•Same
•For sight distance	•Pickup/SUV
Critical Vehicle	Low boy
Subject to Highway Safety Act	Yes

**Design, Operation and Maintenance Standards**

Width	12 - 16 feet plus curve widening
Turnouts	Intervisible
Surfacing	Fully surfaced with approximately 4 inches crushed aggregate
ADT	Moderate - High
Design Speed	10 - 15 mph
Highway Safety Act	Signed to meet MUTCD
Maintenance Level 3 requirements	<ul style="list-style-type: none"> <li>•Do annual inspection (condition survey)</li> <li>•Make repairs as soon as need is recognized</li> <li>•Scheduled blading 2 times per year; dips and/or ditches/culvert inlets cleaned once per year</li> <li>•Clear out blowdown as it occurs and mow every year to maintain safe sight distance</li> <li>•Maintain 4 inches of crushed aggregate</li> <li>•Maintain signs and other safety considerations</li> </ul>

Recommended: \_\_\_\_\_ Date: \_\_\_\_\_

Approved: \_\_\_\_\_ District Ranger Date: \_\_\_\_\_

610803 610901, 610902, 61171  
**ROAD MANAGEMENT OBJECTIVE**  
**Cherokee National Forest**  
**D1**

05/21/99

**Intended Purpose of Road**

The purpose of this road is to provide access for various resource activities on an intermittent basis. There currently is no management activity that requires vehicular access. The road is physically blocked to prevent all vehicular traffic. It will be opened when there is a management need for vehicular traffic. A different Road Management Objective will be in effect during the period of use.

**Design, Operation and Maintenance Criteria**

Traffic Service Level	D	
Maintenance Level	1	
Functional Classification	Local	
Traffic Volume	Zero	
Traffic Classification	Timber 0%, Recreation 0%, Administrative 0%	
Traffic Management	Closed to all vehicular traffic	
Environmental Consideration	May or may not be adjacent to streams and/or have erosive soils	
Design Vehicle	<ul style="list-style-type: none"> <li>•For curve widening</li> <li>•For surfacing</li> <li>•For grade</li> <li>•For travel way width</li> <li>•For sight distance</li> </ul>	<ul style="list-style-type: none"> <li>•Depends on next management activity</li> <li>•Same</li> <li>•Same</li> <li>•Same</li> <li>•Pickup/SUV</li> </ul>
Critical Vehicle	Depends on next management activity	
Subject to Highway Safety Act	No	

**Design, Operation and Maintenance Standards**

Width	10-15 feet
Turnouts	Not necessarily intervisible
Surfacing	May have been spot surfaced; currently grassed or trees growing
ADT	0
Design Speed	5 mph
Highway Safety Act	Does not apply
Maintenance Level 1 requirements	<ul style="list-style-type: none"> <li>•Do annual inspection (condition survey)</li> <li>•Repair only where damage is occurring to adjacent resources</li> <li>•Allow grass, brush to grow up</li> </ul>

Recommended:	Date:
Approved: _____ District Ranger	Date:

61101, 6112, 4202

**ROAD MANAGEMENT OBJECTIVE**  
**Cherokee National Forest**  
**D2-WL**

05/21/99

**Intended Purpose of Road**

The purpose of this road is to provide access for various resource activities on an as-needed basis. In the meantime it serves as a linear wildlife opening. Public traffic is restricted by means of a gate or similar device and access is limited to administrative traffic including contract wildlife maintenance traffic.

**Design, Operation and Maintenance Criteria**

Traffic Service Level	D
Maintenance Level	2
Functional Classification	Local
Traffic Volume	Low
Traffic Classification	Timber 0%, Recreation 0%, Administrative 100%
Traffic Management	Limited to administrative traffic
Environmental Consideration	May or may not be adjacent to streams and/or have erosive soils
Design Vehicle	
<ul style="list-style-type: none"> <li>•For curve widening</li> <li>•For surfacing</li> <li>•For grade</li> <li>•For travel way width</li> <li>•For sight distance</li> </ul>	<ul style="list-style-type: none"> <li>•Depends on next management activity</li> <li>•Same</li> <li>•Same</li> <li>•Same</li> <li>•Pickup/SUV</li> </ul>
Critical Vehicle	Depends on next management activity
Subject to Highway Safety Act	No

**Design, Operation and Maintenance Standards**

Width	10-15 feet
Turnouts	Not necessarily intervisible
Surfacing	May have been spot surfaced; currently grassed - wildlife mixture
ADT	Low
Design Speed	5 mph
Highway Safety Act	Does not apply
Maintenance Level 2 requirements	<ul style="list-style-type: none"> <li>•Do annual inspection (condition survey)</li> <li>•Repair where damage is occurring to adjacent resources</li> <li>•No scheduled blading or drainage work</li> <li>•Clear out blowdown as needed for access and mow annually</li> </ul>

Recommended:	Date:
Approved: _____	District Ranger _____ Date: _____

61102, 6113

**ROAD MANAGEMENT OBJECTIVE  
Cherokee National Forest  
D2-FS**

05/21/99

**Intended Purpose of Road**

The purpose of this road is to provide access for various resource activities on an as-needed basis. Public traffic is restricted by means of a gate or similar device and access is limited to administrative traffic including Forest Service, Special Use/Road Easement or other authorized traffic. Road may be open seasonally during certain hunting seasons.

**Design, Operation and Maintenance Criteria**

Traffic Service Level	D
Maintenance Level	2
Functional Classification	Local
Traffic Volume	Low
Traffic Classification	Timber 0%, Recreation low%, Administrative high%
Traffic Management	Limited to administrative traffic (FS, SU, etc.)
Environmental Consideration	May or may not be adjacent to streams and/or have erosive soils
Design Vehicle	
<ul style="list-style-type: none"> <li>•For curve widening</li> <li>•For surfacing</li> <li>•For grade</li> <li>•For travel way width</li> <li>•For sight distance</li> </ul>	<ul style="list-style-type: none"> <li>•Depends on next management activity</li> <li>•Same</li> <li>•Same</li> <li>•Same</li> <li>•Pickup/SUV</li> </ul>
Critical Vehicle	Depends on next management activity
Subject to Highway Safety Act	No

**Design, Operation and Maintenance Standards**

Width	10-15 feet
Turnouts	Not necessarily intervisible
Surfacing	May have been spot surfaced; could be grassed or other vegetation
ADT	Low
Design Speed	5 mph
Highway Safety Act	Does not apply
Maintenance Level 2 requirements	<ul style="list-style-type: none"> <li>•Do annual inspection (condition survey)</li> <li>•Repair where damage is occurring to adjacent resources</li> <li>•No scheduled blading or drainage work</li> <li>•Clear out blowdown as needed for access and mow every three years</li> </ul>

Recommended:	Date:
Approved: _____ District Ranger	Date: _____

## Attachment 3

FLATWOODS ROAD INVENTORY  
(Step 2 and 3)

Classified Roads: #87, 6112, etc.:

Unclassified Roads Legend:

ABN: Abandoned Road, No Use

ABU: Abandoned Road, Used

TN: Temporary Road, No Use

TU: Temporary Road, Used

OUT: Outlaw Unplanned Road

WL: To Wildlife Opening

SUP: Special use Permit

<u>ROAD #</u>	<u>DISTANCE</u> From Keenburg end	<u>TYPE</u>	<u>NEEDS OR COMMENTS</u>
87	0	ABN01	On left, dashed line on topo
	.1	6112	On left, gated
	.2	TN01	On right, (may have bike use)
	1.0	OUT01	On left, old rd to pvt land
	1.6	TU01	On right
	1.8	ABN02	Left & right
	1.9	TU02	On right
	2.2	ABN03	On left
	2.5	ABN04	On left
	2.5	TN02	On right
	2.8	ABN05	On right
	2.8	ABU01	On left on pvt
	2.9	TU03	On right
	3.1	TU04	On left
	3.5	611101	On right
	3.6	TN03	On left
	4.1	ATV Trail	Xing
	4.2	ABN06	On right
	4.5	ATV Trail	Xing
	4.5	ABN07	On right
	4.6	TN04	On left
	4.6	ABN08	On right
	5.0	ABN09	Left & right
	5.0	ABN10	On right
	5.2	ABN11	On left
	5.3	ABN12	On left
	5.5	ABN13	On left
	6.0	OUT02	On right

	6.1	TU05	On left
	6.3	ABN14	On left
	6.5	TN05	On right
	7.0	610902-Bu	On right
	7.0	TN06	On left
	7.0	TN07	On left
	7.2	TN08	On right
	7.2	TU06	On left
	7.4	610901-Nu	On right tank trap
	8.2	ABN15	On right
	8.2	TN09	On left
	8.3	TN10	On left
	8.4	TN11	On right
	8.5	TN12	On left Eroding due to creek storm flow
	8.5	610803-Nu	On right
	8.8	<del>TN13</del> SUP04	On left
	8.8	WLO1	On right to WLO
	9.1	610820-Nu	On right <i>← SUP04</i>
	9.2	ABN16	On right
	9.3	251 & 87D	Intersection
251		From FS BDY	
	.3	ABN23	On right
	.3	ABN24	On right
	.6	ABN25	On right
	.6	TN14	On left
	1		Intersect 87
87C		OUT03	Several short roads to campsites. Lots of OUT-BU near lake
87		From 251 & 87D	
	0	ABN17	On right-parking area
	.4	ABN18	On right
	.9	TN15	On right-stop 1 auto tour
	1.3	SUP01	powerline 2 gates illegal use
	1.4	TN16	On left
	1.4	TN17	On right
	1.6	TN18	On right
	1.8	WL02	On left gated to WLO
	2.0	TN19	On left
	2.1	ABN19	On right
	2.5	TN18	On right
	2.7	TN20	On right
	2.7	ABN20	On right
	2.8	ANB21	On left
	2.8	ABN22	On right
	3.0	87A	On right
	3.0	87D	On left

87D

From 87A Junction

0	TN21	On right
0	61171	(Which one is which on the map?)
.1	ABU02	On left in curve
.4	ABN26	On right
.7	TU07	On right log landing mud hole
.8	87C	On right
1.0	ABN27	On left w/auto tour stop
1.4	ABU03	On right very active
1.4	TN22	On left
1.5	TN23	On left
1.6	OUT04	On right
1.6	TN24	On right
1.6	ABN28	On left
1.7	ABN29	On left
1.7	ABU04	On right very active
1.8	ABN30	On right
1.9	TN25	On left
1.9	TN26	On left
2.1	TN27	2 roads on right
2.2	OUT05	On right
2.2	ABN31	On left
2.3	ABN32	On left
2.4	TN28	On right
2.5	SUP02	powerline Gate on left erosion
2.5	ABU05	On left
2.7	TN29	Gated on right
2.8	ABN33	On left

87D

2.8	TN30	Gated on right-mud hole
3.1	TN31	On right
3.1	TN32	On left
3.3	TU08	On right
3.3	ABN34	On right
3.4	TN33	On right at gate posts
3.5	SUP03	On right PVT rd
3.5	87D	Turns left
3.8	610801-Nu	On left
3.8	TN334	On right
4.0	TN435	On right
4.4	87 & 251	End of 87d

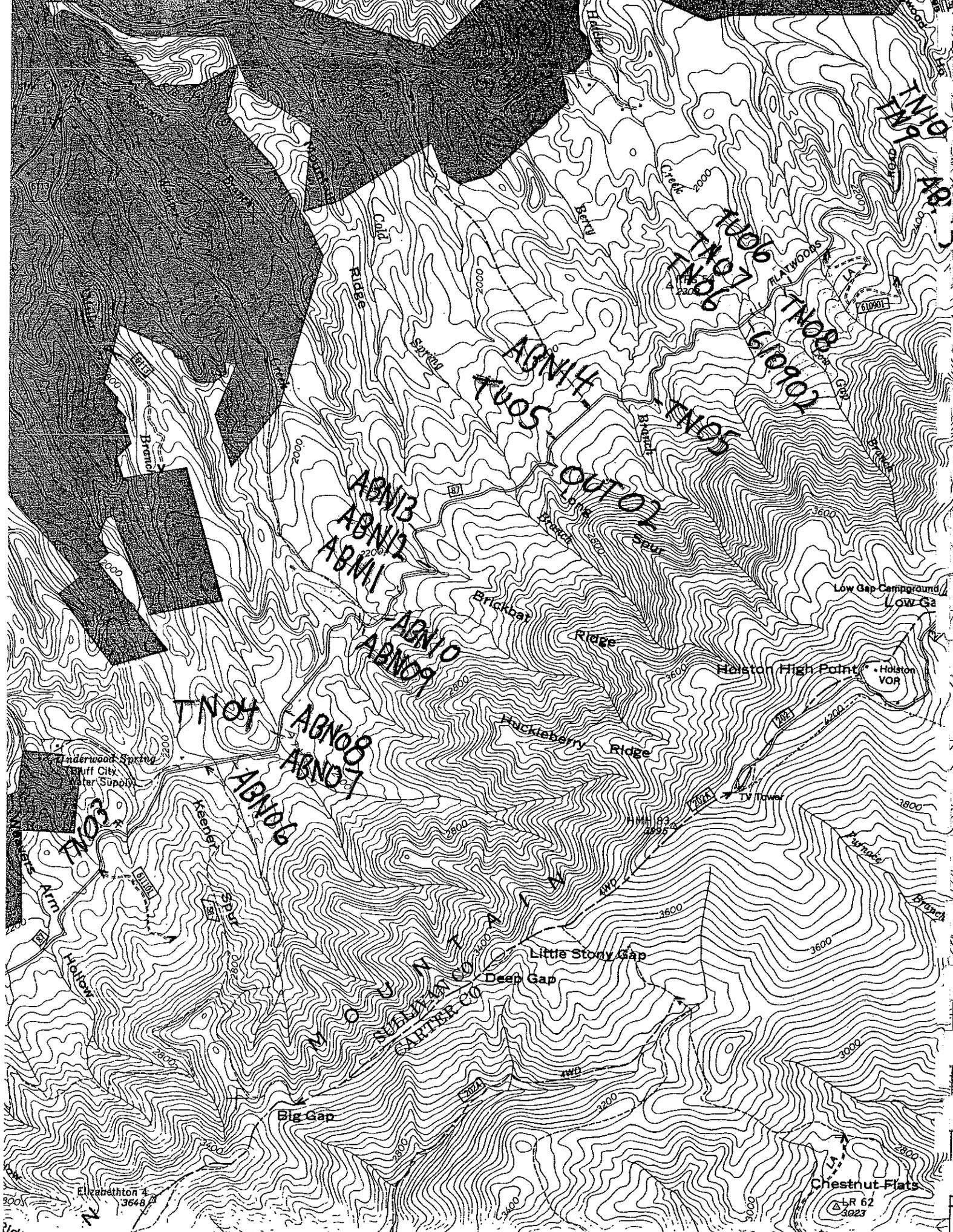
87

From 87A

.1	ABN35	On left Auto tour stop
.2	TU09	On right
.7	TU10	Road to progeny test areas-gate being

		bypassed
1.1	ABN36	On right
1.2	OUT06	Access to temp rd on left
1.2	ABN37	On right
1.2	TN35	On left
1.3	TN36	On right
1.3	TN37	On left
1.7	ABN38	On left old 87
1.8	ABN39	On left & right old 87
1.8	ABN40	On right old 87
2.0	WL03/WL04	Gated right & left to WLO's
2.3	ABN41	Horse trail on right-mudhole
2.3	TN38	On left
2.5	ABN42	On right
2.6	TN39	On right
3.2		Three Rocks



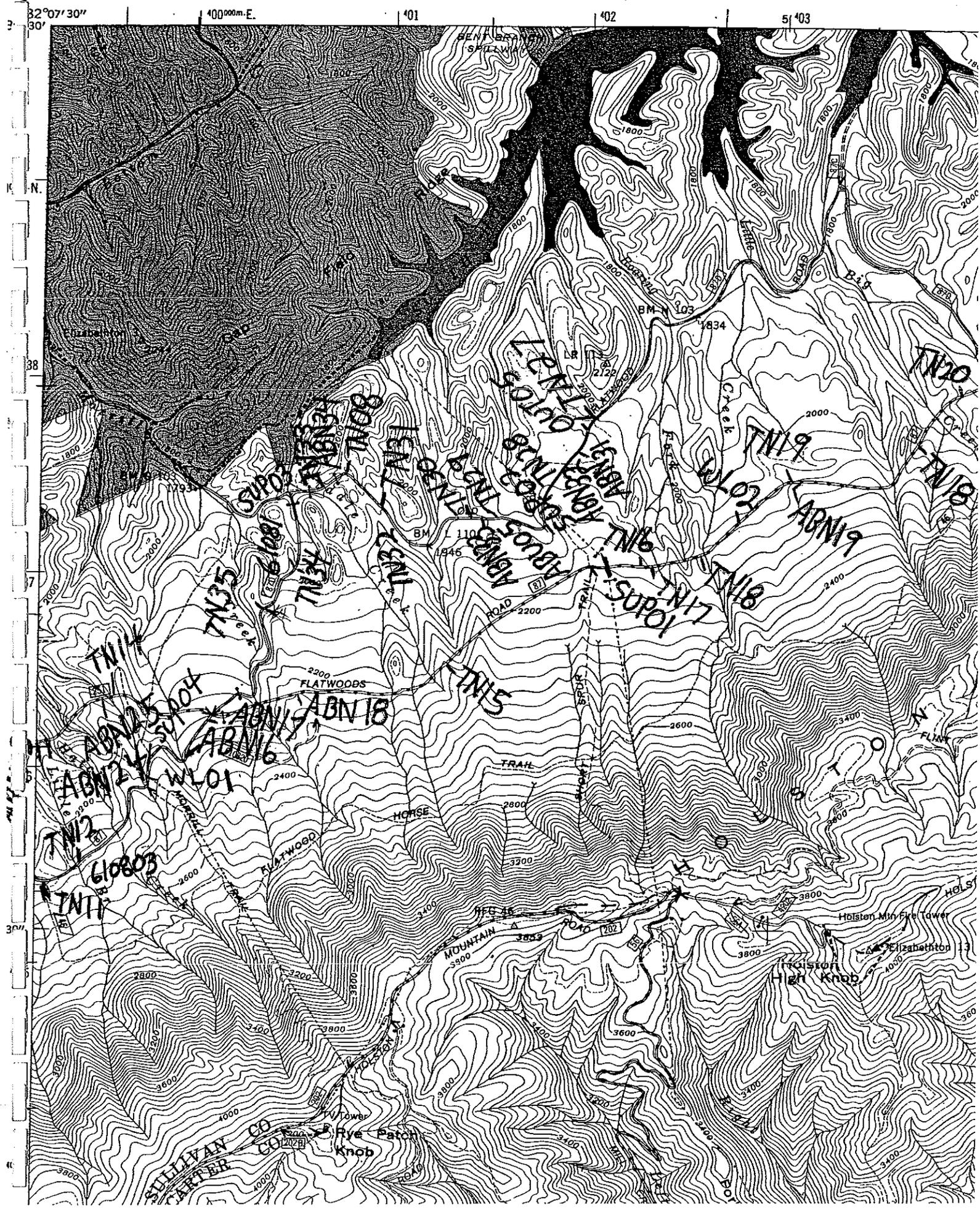


Elizabethton 4  
3648

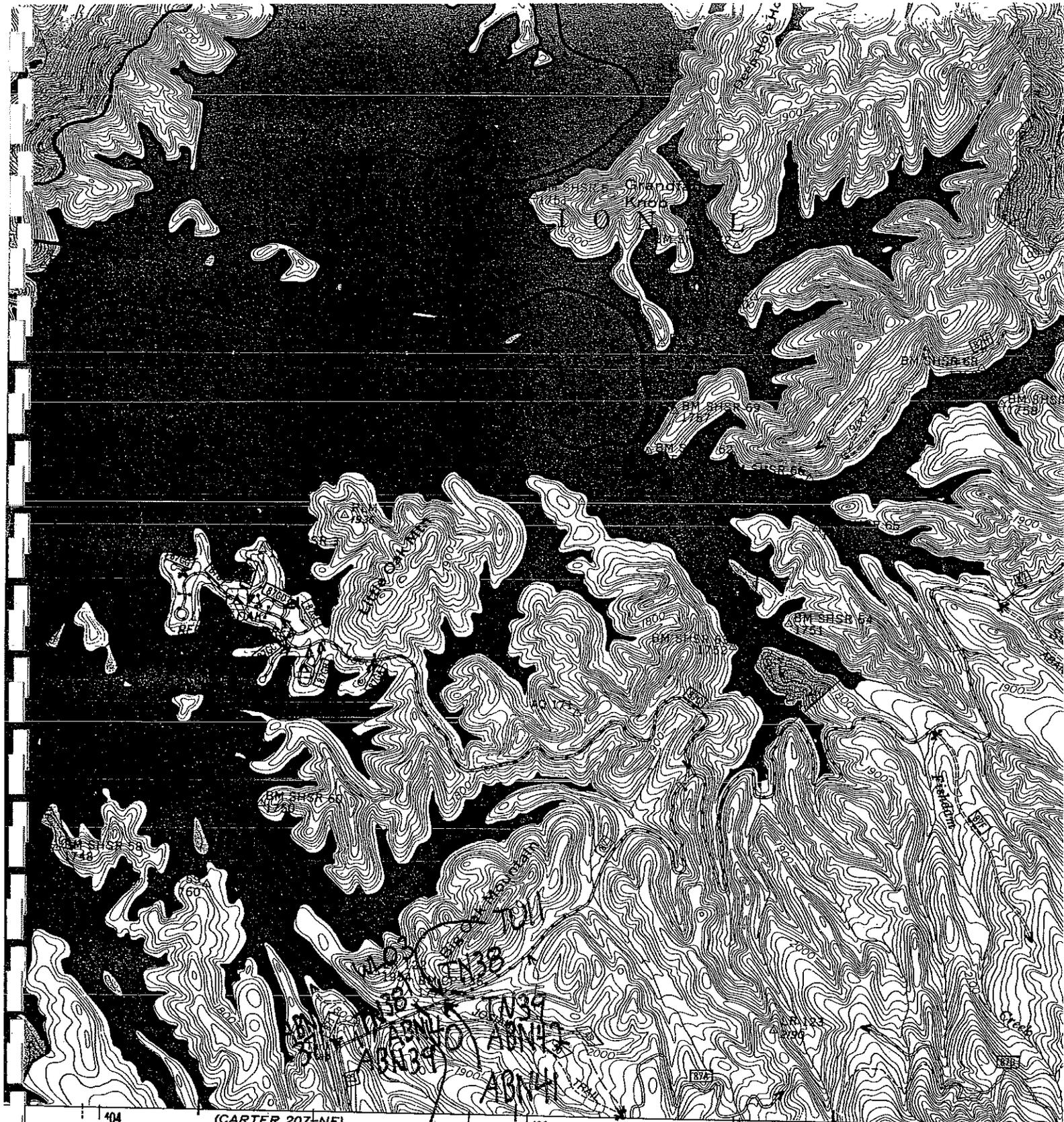
Chestnut Flats  
LR 62  
3023

DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY  
MODIFIED FOR USDA FOREST SERVICE USE

C



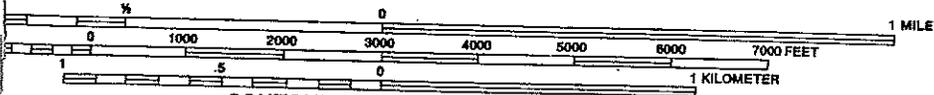




404 (CARTER 207-NE) 405 2'30" 407 408

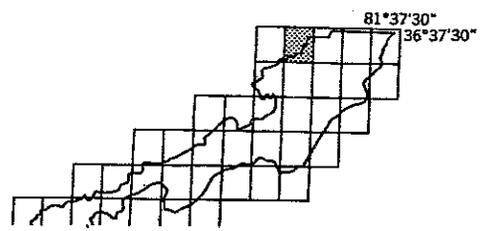
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WLO4



CONTOUR INTERVAL 20 FEET  
 DOTTED LINES REPRESENT 10-FOOT CONTOURS

LEGEND	
— (dotted line) — National Forest Boundary	— (solid line) — Primary Highway
— (dotted line) — Forest Service Land	— (solid line) — Secondary Highway
— (dotted line) — Location Approximate	— (solid line) — Improved Road, Paved
— (dotted line) — Location Approximate	— (solid line) — Improved Road, Gravel
	— (solid line) — Improved Road, Dirt
	15 Interstate Highway
	57 U.S. Highway
	79 State Highway
	37 County Road



Attachment 4  
FLATWOODS ROAD GROUPING

**CLASSIFIED ROADS:**

87	251	61171	610901
87C	4202	611101	610803
87D	6112	61102	610820
202C	6113	610902	

**UNCLASSIFIED ROADS:**

Unclassified Legend:

ABN: Abandoned Road, No Use

ABU: Abandoned Road, Used

TN: Temporary Road, No Use

TU: Temporary Road, Used

OUT: Outlaw Unplanned Road

WL: To Wildlife Opening

SUP: Special use Permit

ABN01	ABN12	ABN23	ABN34
ABN02	ABN13	ABN24	ABN35
ABN03	ABN14	ABN25	ABN36
ABN04	ABN15	ABN26	ABN37
ABN05	ABN16	ABN27	ABN38
ABN06	ABN17	ABN28	ABN39
ABN07	ABN18	ABN29	ABN40
ABN08	ABN19	ABN30	ABN41
ABN09	ABN20	ABN31	ABN42
ABN10	ABN21	ABN32	
ABN11	ABN22	ABN33	

*ABN roads should require no further consideration*

ABU01	ABU03	ABU05
ABU02	ABU04	

TN01	TN11	TN21	TN31
TN02	TN12	TN22	TN32
TN03	<del>TN13</del> SUP04*	TN23	TN33
TN04	TN14	TN24	TN34
TN05	TN15	TN25	TN35
TN06	TN16	TN26	TN36
TN07	TN17	TN27	TN37
TN08	TN18	TN28	TN38
TN09	TN19	TN29	TN39
TN10	TN20	TN30	

*TN roads should require no further consideration.*

TU01	TU04	TU07 campsite*	TU10
TU02	TU05	TU08	
TU03	TU06	TU09	

OUT01	OUT03-camp*	OUT05
OUT02	OUT04	OUT06

WLO1	WL02	WL03
------	------	------

SUP01	SUP02	SUP03
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**ROADS WITH EROSION PROBLEMS:**

TN12  
SUP02

**UNINVENTORIED ROADS COMING IN FROM PRIVATE HOLDINGS**

These roads will be considered as Outlaw Unplanned Roads as they are discovered.

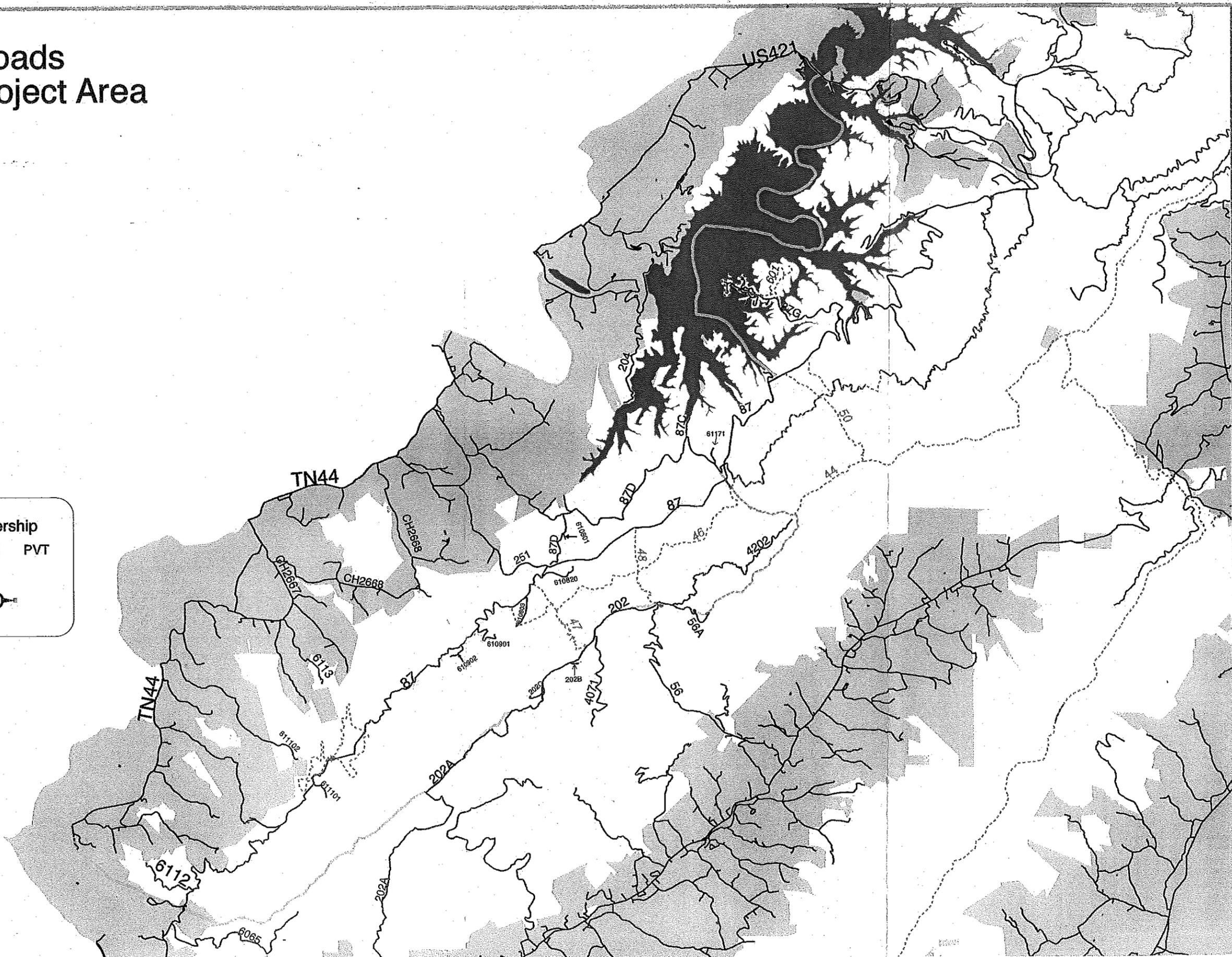
**UNDERWOOD SPRINGS AREA**

There are several uninventoried roads in this area starting from FDR #61102. Some of these access private lands, others serve no resource needs.

\*Field review August 2002 resulted in these revisions. TN13 is actually a special use road, TU07 and OUT03 are now considered primitive campsites.

# System Roads in Flatwoods Project Area

	Project Area	<b>Ownership</b>
	Roads	
	Trails	
	Parking	



**MTC LEVEL SUMMARY FLATWOODS  
PROJECT**

DISTRICT/COMP.	ROAD NO.	ROAD NAME	ML-1 MILEAGE	ML-2 MILEAGE	ML-3 MILEAGE	ML-4 MILEAGE	ML-5 MILEAGE	PURPOSE
Watauga/105-115, 117	202	Holston Mtn.	0	0	0	4.00	0	
	202A	Little Stony	0	5.00	0	0	0	HC
	202C	FAA VOR	0	0.35	0	0	0	FS SP. USE
	202B	WCYB 5 TV	0	0	0	0.13	0	
	204	Spillway TVA	0	3.00	0	0	0	FS Sp. Use
	251	Hickory Tree	0	0	0	0	0.95	
	4202	Flint Mill Gap	0	3.00	0	0	0	WL
	6112	Big Arm Wood-Cove Ridge Rd.	0	1.00	0	0	0	WL
	6113	Miller Branch	0	0.44	0	0	0	FS to PVT.
	610801	Old Spring Road	0.09	0	0	0	0	
	610803	Little Branch Road	0.37	0	0	0	0	
	610820	Morrill Creek	0	0.55	0	0	0	
	610901	Upper Hatcher Creek	0.67	0	0	0	0	
	610902	Low Gap Branch	0.27	0	0	0	0	
	611101	Kenner Spur	0	0.30	0	0	0	WL
	611102	Underwood Springs	0	0.57	0	0	0	FS to PVT.
	56A	Holston High Knob	0	1.20	0	0	0	
	87	Flatwoods-Keenburg	0	0	9.40	0	0	
	87	Flatwoods-421 to hickory tr	0	0	0	0	12.54	
	87C	Big Creek	0	0	0.29	0	0	
	87D	Old Flatwoods	0	0	4.44	0	0	
<b>TOTAL BY MTC.</b>			1.40	15.41	14.13	4.13	13.49	48.56