Middle and Upper Tellico River Ecosystem Assessment
Tellico Ranger District
Cherokee National Forest

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Introduction

Description of Watershed

The Middle and Upper Tellico River (MUTR) Assessment Area is located in Monroe County, Tennessee, in the area adjacent to Tellico Plains. Figure 1 displays the location of the assessment area within the Tellico Ranger District of the Cherokee National Forest (CNF). The area is located in the Southern Metasedimentary Mountain Eco-region. The assessment area is 67.6 square miles (43,300 acres) in size. Land ownership within the assessment area is 67% in National Forest System (NFS) lands. and 33% in private ownership. Most of the private land ownership is concentrated in the western portion of the watershed. Elevation in the area ranges from about 820 feet at the confluence of Wildcat Creek and Tellico River to 5000 feet along Haw Knob. The watershed drains to the Little Tennessee River.

The assessment area has an average annual temperature of 55 degrees Fahrenheit. January is usually the coldest month with an average temperature of 35 degrees Fahrenheit, while July is usually the hottest month with an average temperature of 75 degrees Fahrenheit. The area averages about 55 inches of precipitation annually, which is distributed somewhat evenly throughout the year. March is usually the wettest month with an average of 5.9 inches of precipitation, while October is usually the driest with an average of 3.0 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.

The majority of the assessment area is in Management Prescription (MP) 7.B of the Cherokee National Forest Revised Land and Resource Management Plan (RLRMP) (USDA 2004). Table 1 displays the approximate land acreages by Management Prescription.

Table 1. Management Prescription acreages in MUTR

Management Prescription	NFS land Acreage
1.A	**693**
12.B	**5,629**
5.A	**6**
7.A	**2,419**
7.B	**7,116**
7.D	**69**
8.B	**6,754**
9.F	**716**
9.H	**260**
11	**5,316**
Total	**28,978**

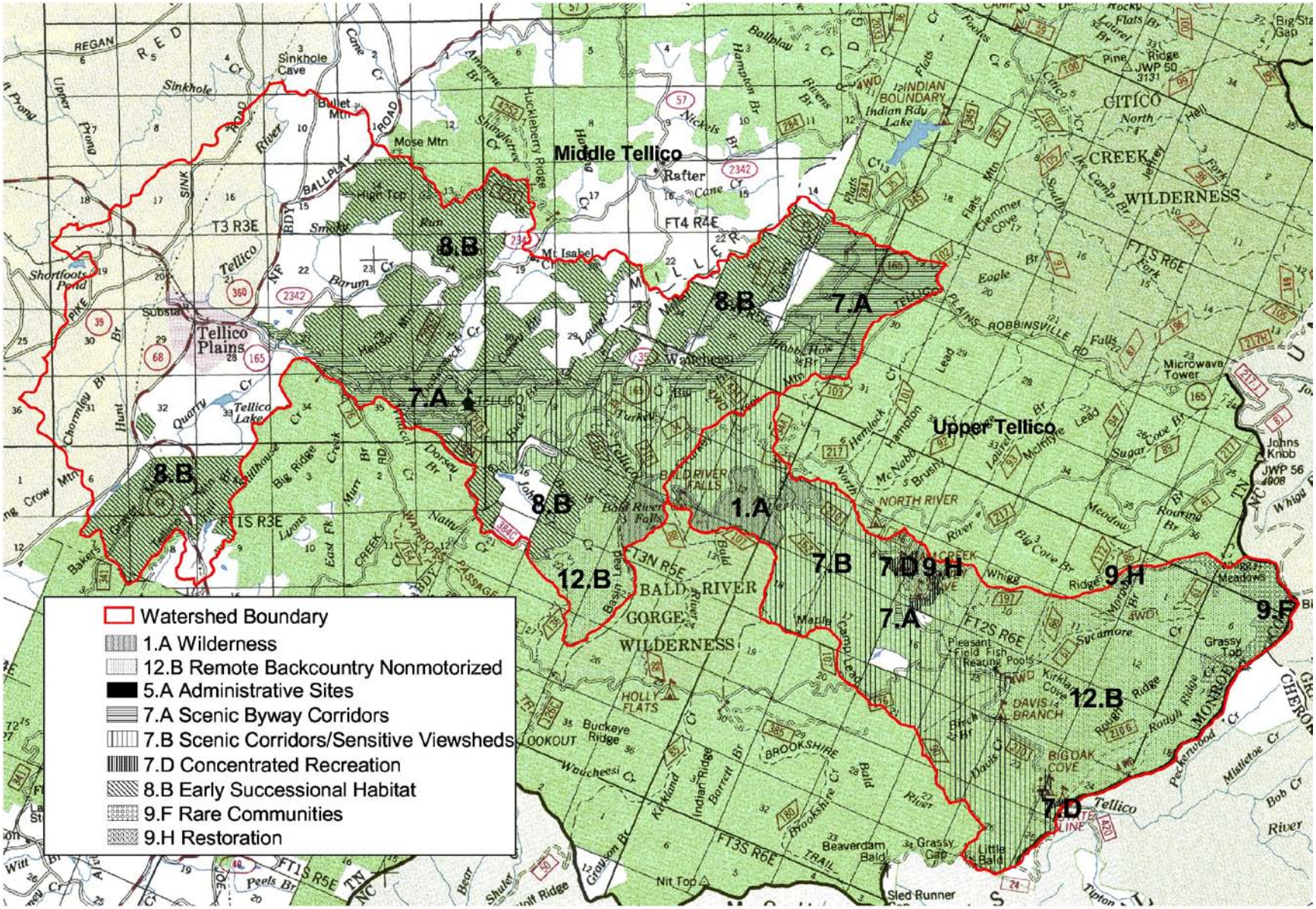


Figure 1. Vicinity Map

Physical Elements

Soils/Watershed/Riparian, Wetlands, and Floodplains

Existing Condition

The MUTR is located about one mile northeast of Tellico Plains, Tennessee in the Blue Ridge Mountains. The area is located in the Southern Metasedimentary Mountain Eco-region. The assessment area is 67.6 square miles (43,300 acres) in size. Land ownership within the assessment area is 67% in public (National forest) and 33% in private ownership. Most of the private land ownership is concentrated in the western portion of the watershed. Elevation in the area ranges from about 820 feet at the confluence of Wildcat Creek and Tellico River to 5000 feet along Haw Knob.

The assessment area has an average annual temperature of 55 degrees Fahrenheit. January is usually the coldest month with an average temperature of 35 degrees Fahrenheit, while July is usually the hottest month with an average temperature of 75 degrees Fahrenheit. The area averages about 55 inches of precipitation annually, which is distributed somewhat evenly throughout the year. March is usually the wettest month with an average of 5.9 inches of precipitation, while October is usually the driest with an average of 3.0 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.

The landform of the area is characterized by steep, dissected mountains and narrow V-shaped valleys. The physical character of the assessment area is greatly influenced by the geology associated with the Blue Ridge Physiographic province. Geology is a mixture of Precambrian-age metamorphic and sedimentary materials such as bouldery colluvium; Precambrian sandstone, siltstone, shale, quartzite, greywacke, arkose, phyllite, slate and schist and Quaternary sandy shaly colluvium; Cambrium shale, sandstone, siltstone, quartzite and conglomerate. The diverse parent material along with other factors such as aspect, topography, and climate has resulted in soil types with different characteristics. Common soil series found within the assessment area includes Jeffery, North Cove, Keener, and Junaluska.

Keener and North Cove soils are found on foot slopes, high stream terraces, benches, fans, and coves. They are very deep, strongly acidic, well drained ultisols; textures range from loam to sandy clay loam. Subsoil permeability is moderate to moderately rapid. Keener soils occur on slopes up to 65 percent and North Cove maybe found on slopes up to 80 percent. Runoff is generally low to medium and increases with slope. The 2 inch organic layer found on each of these soils plays a vital role in controlling runoff. If the organic layer is disturbed runoff will increase. Erosion is generally low on undisturbed soils but may increase with disturbance. Keener soils may be found at 1400 to 3500 feet in elevation and North Cove soils are found at 1200 to 3800 feet. These soils are formed from colluvial materials that are subject to slippage and slumping during extreme wet soil conditions.

Jeffery and Junaluska soils are found on ridge tops, and side slopes. These are moderately deep, strongly acidic, well drained soils with moderate permeability. The Jeffery series is an inceptisol with a cobbly loam texture throughout the soil profile. The Junaluska series is an ultisol; texture ranges from loam in the upper horizons to sandy clay loam in the subsoil. Each series may be found on slopes ranging from 2 to 95 percent. Runoff is typically moderate but increases with the

amount of surface disturbance and slope. Junaluska soils are found at 1400 to 3500 feet elevation and Jeffery soils are found from 3000 to 5000 feet. Depth to bedrock may be a limiting factor for these soil types.

Valley types within this assessment area exhibit moderate relief, are generally stable, and have moderate side slope gradients. The upper reaches of streams can be described as A and B types by the use of the classification system developed by Rosgen (Rosgen 1994). 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 bedrock, boulders, gravel and sand. Larger streams generally have a decrease in gradient, and stream types are more characteristic of B and C channels. Both of these stream types are generally stable.

Stream flow varies seasonally due to rainfall and evapo-transpiration. Streams within the assessment area have an estimated, average annual discharge of about 2.4 cfs per square mile of watershed (USGS 2008). Higher discharges generally occur in the winter and spring months while low flows generally occur in the late summer and fall. Low flows (7Q10) generally range from 0.1 to 0.5 cfs per square mile of watershed.

Drainages within the assessment area include Tellico River, and several tributary streams of Tellico River including the Laurel Branch, McNabb Creek, Hemlock Creek, Turkey Creek, Basin Creek, Caney Branch, Laurel Branch, Rough Ridge Creek, and Sycamore Creek.

The water quality of Tellico River and tributary streams within the assessment area can generally be characterized as low in conductivity, low in alkalinity, slightly acidic, and low in nutrients. Tributary streams in the assessment area are generally free of excessive sediment. However, water quality impacts associated with turbidity/sedimentation is of particular importance in the Tellico River.

Surface erosion processes are dominant within the assessment area. The primary source of this erosion in this assessment area is from roads, trail systems, and the Upper Tellico OHV Area in North Carolina. National Forests of North Carolina (NFsNC) and the Tennessee Valley Authority (TVA) have been collecting total suspended sediment data in the Upper Tellico Watershed in North Carolina since 1998. Results have shown elevated levels of erosion and sediment delivery to stream channels in the assessment area and downstream in the Tellico River. Thus, sediment from National Forest System lands is considered to be problematic within the Upper Tellico River watershed (NFsNC Watershed Assessment 2005).

In the assessment area there are approximately 143 miles of road. Road density is about 2.1 miles of road per square mile of the watershed. Approximately 47 miles of the National Forest System Roads (NFSRs) are gated, vegetated, and/or closed seasonally or throughout the year to all but administrative traffic. Roads in the assessment area are aggregate (gravel) surfaced with drainage control structures in place; the exception is Tellico River Road which is paved. Drainage control is by means of ditches, cross drain culverts, broad based dips, turnouts or a combination of these. Most cut and fill slopes have been revegetated by natural or induced means (most often by a combination). There are approximately 26 miles of roads within 100’ of streams. Within this assessment area, NFSRs 210, CH512, 210G, CH525, FR 40541, and approximately 3 miles of TN 165 are most significant in terms of their length, proximity to stream, and potential influence on surface and subsurface hydrology. These roads have at least one mile of road located within 100’ of Tellico River, Caney Branch, Rough Ridge Creek, Basin Creek and Turkey Creek. These and other streams have road crossings that also are points of

connectivity of road runoff to streams. Often, these crossings are made by the use of culverts or bridges. Other roads within the assessment area are basically ridge-top/upper side-slope road locations with reduced connectivity to surface and subsurface water. Some road conditions have deteriorated due to the lack maintenance.

There are many recreation areas located within the Tellico River Corridor. Designated and particularly dispersed areas located within the riparian corridor have the potential to impact the soil and water resource. Impacts include compaction, erosion, soil displacement, and slope stability. Disturbance to vegetation that exposes the soil is the most critical factor. Sites that are compacted and completely devoid of ground vegetation are likely to be a source of long-term erosion. Erosion sediment delivery is most likely to take place in the riparian area during storm or flood events. Other concerns with dispersed campsites are associated with the number of sites in the corridor, their lack of design and maintenance, and their close proximity or distance from streams. As sites deteriorate, they become less attractive for use and there is the potential for other sites to be created or existing areas to become enlarged. These areas are subject to continuing erosion if mitigation measures are not utilized. Many of these sites contain short segments of user-created trail that connect directly to the water's edge. This provides a means for eroded soil to be transported directly into streams. The closer the sites are to streams the less chance there is for vegetation and litter to trap soil particles. Designated campsites may have some of the same issues as dispersed if not managed properly.

Desired Future Condition

The water quality of streams assessed within the watershed has been found to meet their use classifications. However, water quality may be increased by reducing sediment yield from roads and trails.

The Tennessee Eco-region Project has completed an initial effort to establish reference conditions for water quality by eco-region (TDEC 2000). A summary of selected water quality statistics for the Blue Ridge Eco-region represented in the assessment area is displayed in Table 2 below. The data values and statistics shown represent sites within the entire eco-region, and provide a first approximation of reference water quality.

Table 2. 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
Dissolved Oxygen	Mg/l	152	7.74	16.60	10.06	10.31
Suspended Residue	Mg/l	164	5.00	49.00	5.00	5.51
Dissolved Residue	Mg/l	164	5.00	126.00	22.00	26.96
Turbidity	NTU	163	0.10	15.00	0.90	1.50

While the reference conditions present the best case in terms of water quality, the desired future condition for water quality within the assessment area would be for all waters to achieve their designated use criteria established by the State of Tennessee. Roads, trails, dispersed recreation sites and other areas contributing to accelerated erosion and sediment yields will continue to be treated to minimize water quality impacts.

Opportunities

Impacts to water quality associated with turbidity/sedimentation are of particular importance due to the designated uses of Tellico River. Impacts from the Upper Tellico OHV Area are not well documented for the portion of Tellico River within the CNF. A monitoring plan should be developed and implemented by the CNF to determine impacts to water quality. Potential partners for determining impacts include Tennessee Department of Environment and Conservation (TDEC), U.S. Geological Survey, Environmental Protection Agency, and TVA. The CNF should continue to collaborate with NFsNC on issues related to the Upper Tellico OHV Area. Within the CNF water quality in Tellico River can be improved by determining the sources of turbidity/sediment entering Tellico River from Laurel Branch and Turkey Creek. Partnerships with Natural Resource Conservation Service, TDEC, and private land owners should be created when water quality is being affected from activities occurring on private lands. Road improvement and maintenance within the assessment area is needed to decrease impacts to streams. Opportunities for relocation or decommissioning of roads will be considered on a case by case basis as opportunity and funding allows.

Recommendations/Priorities

Priority for this watershed is to develop and implement a water quality monitoring plan for the Tellico River. Partnerships with state and federal agencies such as the ones listed in the opportunities section should be determined.

Roads open seasonally or year-long to administrative and public traffic are of primary concern from the standpoint of accelerated erosion and off-site soil movement. Surface drainage can be improved by additional aggregate surfacing, additional drainage dips, cross drain culverts, berms and/or out sloping. These mitigation measures can reduce the impacts associated with the roads, including effects to surface and subsurface hydrology, and erosion/sediment rates. Create ditch turnouts so that ditch lines do not empty directly into stream channel, repair or replace culverts that are not functioning properly. Most of the NFSRs are gated and closed to all but administrative vehicle traffic. These roads are generally vegetated and stable with minimum soil loss.

Designated and user-created recreation areas should be monitored to determine impacts to the soil and water resources. Site-specific analyses of areas are needed to determine there long term sustainability for future use. Unsustainable actively eroding sites will be closed and rehabilitated. With some extended periods of non-use, there is potential that some sites might be rehabilitated or restored to levels that they could again be re-used for a period of time. User-created sites should be closed or brought up to forest standards. Over time, it is expected that current adverse effects to soils from user-created areas will be reduced by implementing RLRMP standards. Unmanaged recreation uses were identified by the Chief of the Forest Service as a threat to national forest management

Air

Existing Condition

Acid Deposition-Water Chemistry

The Upper Tellico portion of MUTR watershed has a high risk to impacts from acidification because of the sensitive geology that has produced soils with limited amounts of base cation

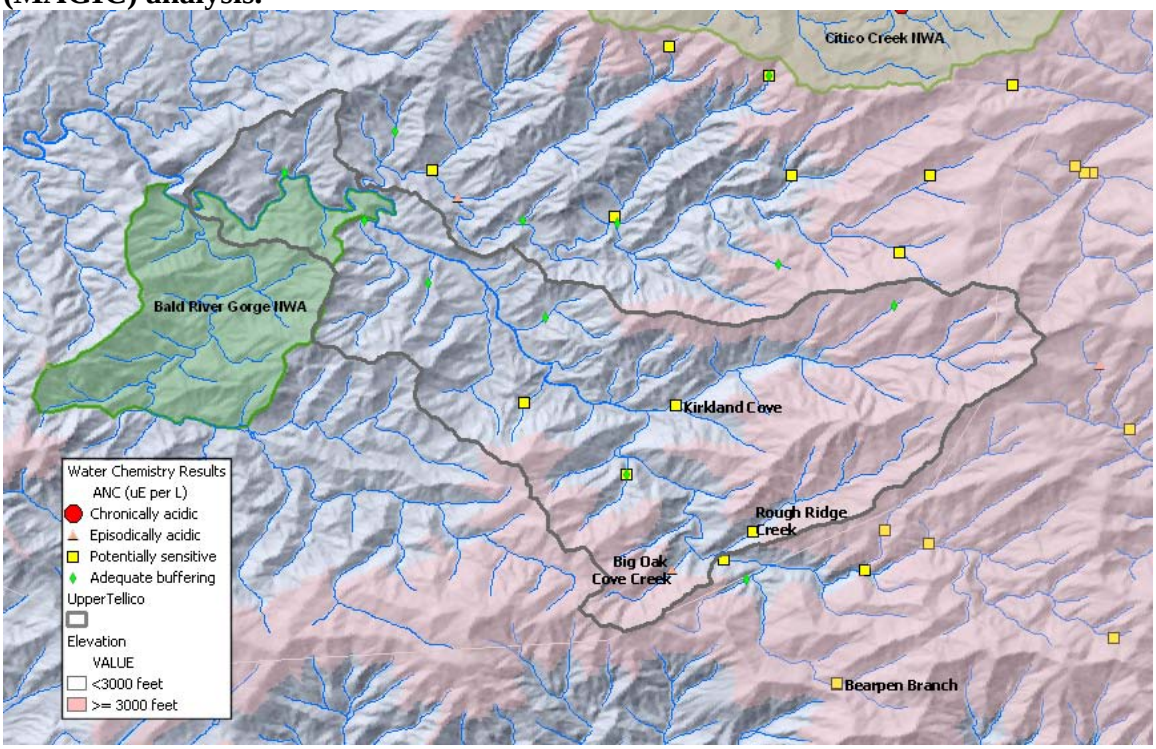
reserves, and the high amount of acidic deposition from the atmosphere for numerous decades. Excessive deposition of acidic compounds of sulfur and nitrogen from the atmosphere can contribute to adverse impact to the health of the vegetation and aquatic ecosystems.

Typically, sulfur deposition has the greatest concern since it can accumulate in the soils, and when the sulfur compounds are released into soil water solution it (as does nitric acid in some situations) will remove an equivalent amount of base cations (calcium, magnesium, and potassium) from the soils. Some sensitive soils derived from the same lithology as in western North Carolina maybe near their maximum sulfur adsorption capacity, and calcium and other base cations (needed for healthy terrestrial and aquatic ecosystems) are rapidly being depleted (Elliott et al. 2008). The sulfur is usually deposited as sulfuric acid, which lowers the pH of the soils. A reduction of soil pH below 4.5 is likely to allow aluminum to become mobile and move into the soil water solution (Elliott et al. 2008). High concentrations of aluminum are toxic to aquatic organisms.

One way to examine if watersheds are suffering from historical acidification and base cation depletion is to collect water samples and have them processed for the amount of base cations and acids anions. The acid neutralizing capacity (ANC) can be calculated as the sum of the bases (calcium, magnesium, potassium and sodium) minus the sum of the mineral acids (sulfate, nitrate, and chloride). Streams having ANC values of greater than 50 microequivalents per liter (μeq/L) are considered by many researchers in the southeastern United States to have adequate buffering capacity to offset the future deposition of sulfur and nitrogen compounds, but some highly sensitive aquatic organisms may be adversely impacted at ANC values near 50 μeq/L. ANC values less than zero (0) are considered chronically acidic and have no buffering capacity to acid inputs. Many aquatic organisms would generally not occur under such conditions, including native brook trout. Marginal brook trout populations may be present in streams having ANC between 0 and 20 μeq/L (episodically acidic), but these streams are highly sensitive to periodic (episodic) acidification to ANC values below zero. Streams having ANC between 20 and 50 μeq/L are potentially sensitive to chronic and episodic acidification and brook trout populations may or may not occur (Sullivan et al. 2002, and Snyder et al. 2004).

A total of 10 locations in the Upper Tellico have had one or more water samples processed to estimate the stream ANC based upon calculating the difference between the amount of base cation and acid anions. Five streams were classified as having adequate buffering capacity, four streams were classified as potentially sensitive, and one stream was classified as episodically acidic (Figure 2). Most of the Upper Tellico watershed has a low buffering capacity to offset any sulfur released from the soils or deposited from the atmosphere (Sullivan et al. 2007); and portions of the watershed are above 3000 feet where cloud deposition of sulfur compounds can be large, and the soils are colder and there is less microbial activity to process the sulfur compounds.

Figure 2. Calculated stream acid neutralizing capacity (ANC) results for the Upper Tellico watershed. Results are displayed on a shaded relief map and the sites with the name beside the symbol were included in the Model of Acidification of Groundwater in Catchments (MAGIC) analysis.



Estimated Historical and Future Water Chemistry

The Model of Acidification of Groundwater in Catchments (MAGIC) has recently been utilized at numerous sites in the southern Appalachians, including the Upper Tellico -- 3 locations in Tennessee and 1 site in North Carolina (Figure 2)**.** The use of MAGIC has allowed us to: 1) estimate soil base saturation, and stream water ANC, sulfate, and pH; and 2) evaluate how the historical sulfur deposition and projected future deposition may influence future soil base saturation and stream water chemistry (Sullivan et al. 2007). The modeling estimates that will be discussed begin in 1860 and end in the year 2100.

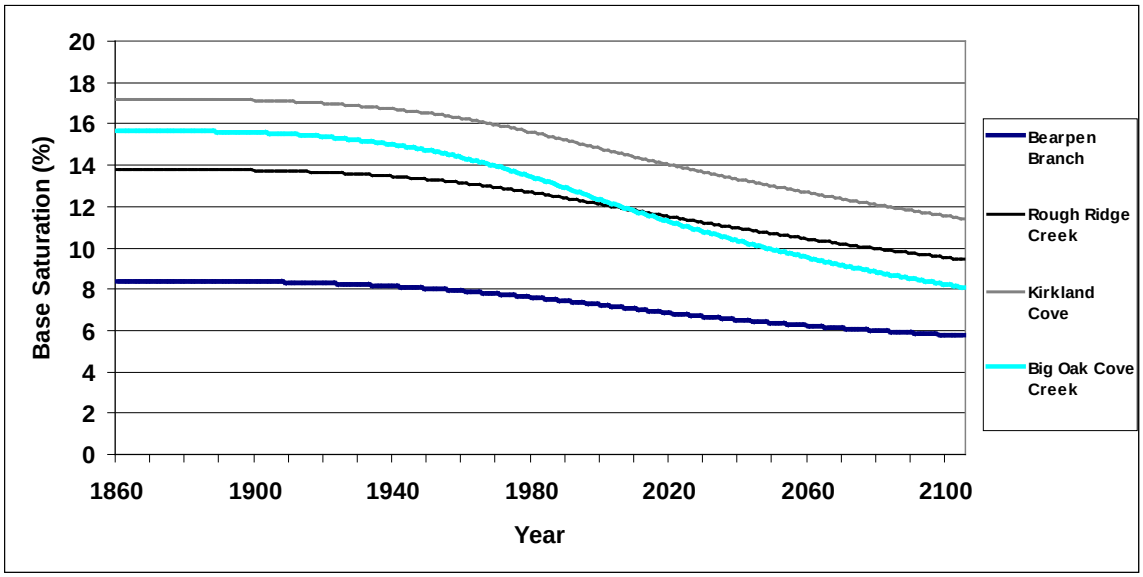
It should be noted that the MAGIC assumptions included significant sulfur deposition reductions by 2018 that were anticipated with sulfur dioxide emission reductions from the Clean Air Interstate Rule (CAIR) (Sullivan et al. 2007). Though a Federal Court has vacated the CAIR, it is reasonable to assume that an equivalent amount of sulfur dioxide emission reductions will be needed to attain the Regional Haze goals and fine particulate matter National Ambient Air Quality Standards in the eastern United States.

MAGIC needs field estimates of both water and soil chemistry in order to make the predications. Water samples were collected at all the sites and soil samples were collected from the watersheds of Kirkland Cove, Rough Ridge Creek and Bearpen Branch (North Carolina). No soil samples were collected from Big Oak Cove Creek; instead the soils data were borrowed from Rough Ridge Creek (Sullivan et al. 2007). The soils samples at the Bearpen Branch watershed had a low base saturation (7.15%) and the soil pH was 4.26. The base saturation was greater at Rough

Ridge Creek (12.09%) and Kirkland Cove (14.65%) and soil pH values were low at 4.44 and 4.32, respectively. Soils with a pH below 4.5 have a high risk that biologically toxic levels of aluminum could be impacting the fine roots of vegetation, and eventually aquatic biota.

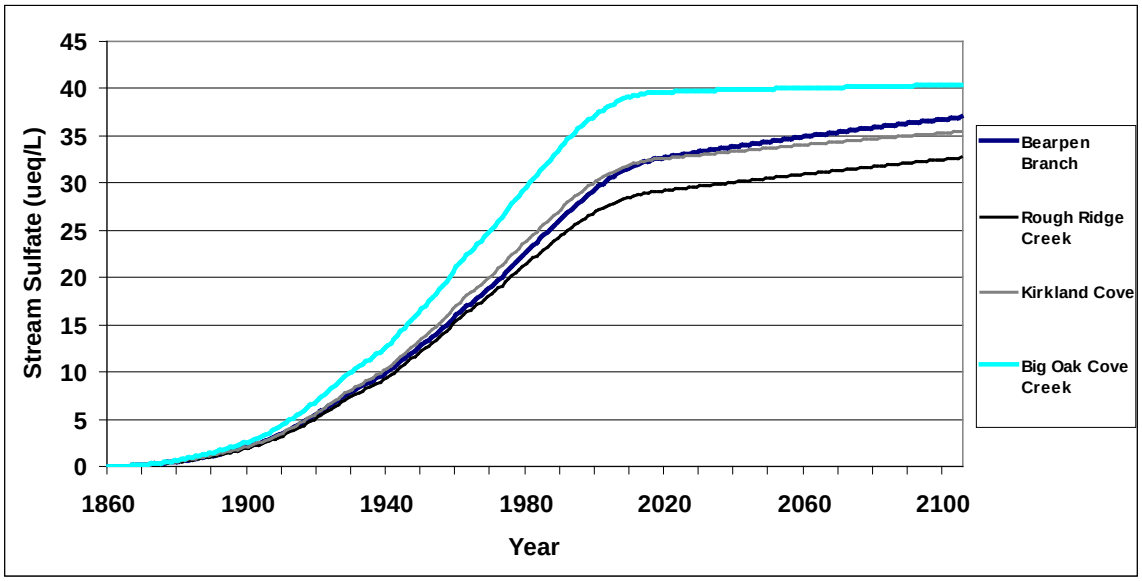
Soil base saturation has been suggested as a critical indicator of watershed health, and many researchers consider values below 10% or 15% to indicate unhealthy conditions in the watershed (Sullivan personal communication). In 1860, two of the four watersheds may have had base saturation below 15%. By 2100 all four of the modeled watersheds had a base saturation of below 15%, and Bearpen Branch, Big Oak Cove Branch, and Rough Ridge Creek had values below 10% (Figure 3).

Figure 3. Modeled changes between 1900 and 2100 in soil base saturation (percent).



MAGIC estimated that in 1860 the stream water sulfate concentration was 0 μeq/L (Figure 4) and this indicates that naturally occurring sulfur within the bedrock is not impacting the watersheds. The amount of sulfates in the streams in the four modeled watershed has increased steadily and mirrors the emissions patterns of sulfur dioxide (and hence sulfur deposition). Sulfur deposition began increasing after 1860 and increased tremendously starting in the early 1900s, about the time copper smelting operations increased in the Copper Basin (about 25 miles to the southwest). MAGIC estimated the rate of stream sulfate concentration increased starting in the early 1900s and then began to slow in the1990s. The reduced rate seen in the 1990s does correspond with decrease sulfur deposition as a result of implementation of sulfur dioxide controls (primarily at coal-fired power plants) under the Clean Air Act Amendments of 1990. Further sulfur dioxide emission reductions are anticipated between 2005 and 2018 and this will reduce the rate at which stream sulfate concentrations are likely to increase (Figure 4). Stream sulfate concentrations are unlikely to decrease significantly for centuries because: 1) there will still be some sulfur deposition from the atmosphere, and 2) perhaps more importantly, the historical sulfur deposition that accumulated in the soils will slowly be released into the soil water solution where it will carry an equivalent amount of base cations.

Figure 4. Modeled changes between 1900 and 2100 in stream water sulfate concentrations (microequivalents per liter (μeq/L)).



The historical and future removal of base cations by sulfates will have a significant influence on the stream acid neutralizing capacity, and subsequently impacts to aquatic biota. In 1860, the model predicted the calculated ANC was between 45 and 65 μeq/L and after 1990 the calculated ANC will continue to decrease into the future (Figure 5) even though sulfur deposition is expected to decrease. Bearpen Branch (North Carolina) is predicted to become a stream classified as episodically acid. Streams classified as episodically acidic can have both sub-lethal and/or lethal effects on brook trout populations (Sullivan et al 2007). The hydrogen ion concentration, as measured by pH, is also predicted to decrease in the future. In 1860, MAGIC predicts the stream pH was between 6.6 and 6.7, and by 2100 the values are predicted to decrease between 5.8 and 6.4 (Figure 6).

Figure 5. Modeled changes between 1900 and 2100 in stream calculated acid neutralizing capacity (microequivalents per liter (μeq/L)).

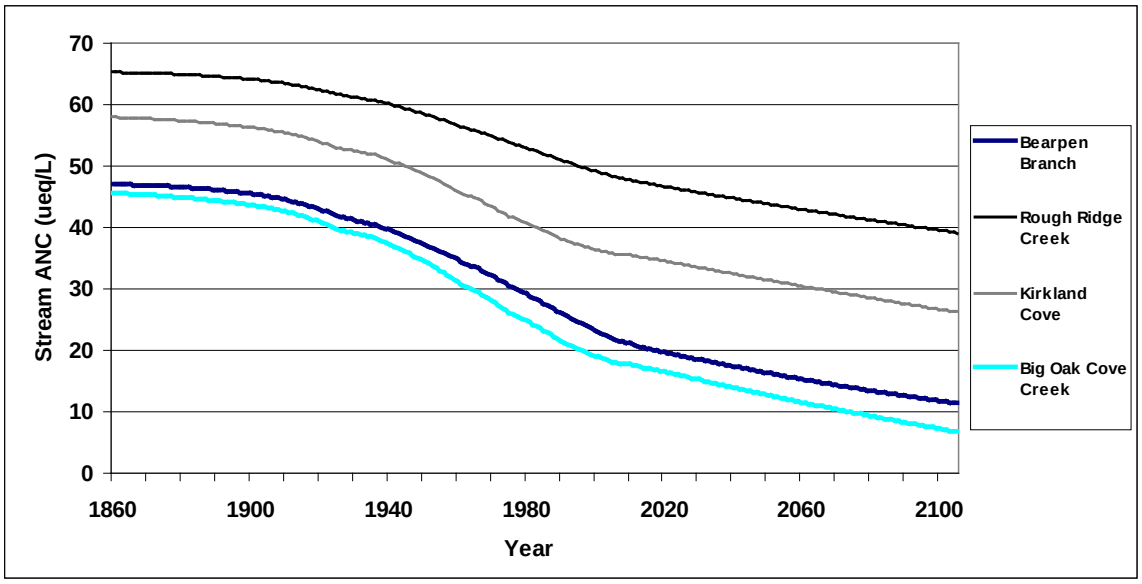
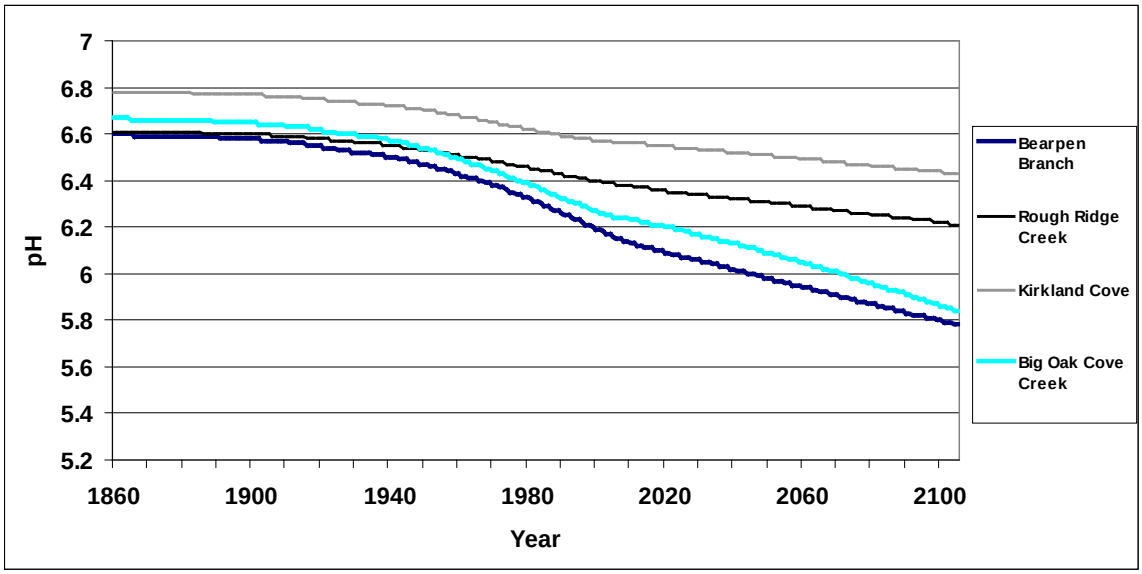


Figure 6. Modeled changes between 1900 and 2100 in stream pH.



Opportunities

Recommendations/Priorities

Current sulfur dioxide emission reductions program are not sufficient to reverse the base cation, especially calcium, loss from the soils and increase the stream calculated ANC. Reductions in available calcium can have serious adverse effects to both terrestrial and aquatic biota. However, the impacts from sulfur deposition could be mitigated and the health of the watersheds restored with an appropriate application of limestone to the soils (Elliott et al. 2008) in the Upper Tellico watershed.

Minerals

Existing Condition

The Forest Service currently owns all lands and subsurface rights within the Bald River Gorge Wilderness Area.

Currently we issue approximately 2 to 3 common variety mineral (rock) permits a year within the MUTR. These are personal use permits that allow the holder to gather 3 tons of surface rock. Rocks can not be collected in riparian areas.

In 1990 we issued approximately 15 recreational gold dredging permits. In 2007 we issue approximately 250 recreation gold dredging permits a year. These permits cover the Tellico River and it tributaries from the mouth of Turkey Creek downstream to National Forest System land. These permits are good for three months and have the rules and regulations for recreational gold dredging attached to them.

Hand panning for gold does not require a permit and it is prohibited in Bald River Gorge Wilderness. Also, rock hounding (a person who hunts and collects rocks and minerals as a hobby) does not require a permit. This would be a handful of rock or minerals collected form the surface of CNF lands.

There are seven tracts of either reserved or outstanding mineral rights in the MUTR. These tracts contain a total of 1,034 acres.

Desired Future Condition

To meet the public demand rock by continuing to issue personal use common variety mineral.

Continue to allow hand panning for gold and rock hounding.

Balance the demand for gold dredging permits with the need to protect the resources.

For the U.S. Government to own all outstanding and reserved mineral rights in the MUTR.

Opportunities

Continue issuing common variety mineral permits for personal use.

Issue common variety mineral permits for commercial use to meet demand. These permits will require an approved mining and reclamation plan.

Complete an environmental analysis of gold dredging on the South Zone to evaluate current impacts and recommendations.

Seek funding to establish U.S. ownership of these private mineral rights under the Tennessee Dormant Mineral Statue.

As surface permits requested apply S&G.

Work with mineral owners if activity begins.

Work with BLM if any mining proposals are submitted.

Recommendations/Priorities

Complete analysis for gold dredging and implement.

Request funding to acquire the outstanding and reserved mineral rights in MUTR.

Biological Elements

The biological environment includes all elements of the plant and animal communities. The primary elements that can be managed and/or monitored, include habitat components and individual species of concern or interest. Discussions of these elements are organized in this document following the framework used during Forest planning in the RLRMP and FEIS (USDA 2004a and 2004b). Use of this framework is designed to ensure comprehensive consideration of the biological environment. Elements in this framework are evaluated to determine there relevance to this assessment area and only those relevant elements are discussed further in this document (Table 3).

Table 3. Elements of the biological environment, derived from Forest plan analysis, and their relevance to the Middle and Upper Tellico Watershed Assessment Area, Cherokee National Forest, Monroe County, Tennessee, 2009.

Biological Element	Discussed Further?	Relevance to this Project
Major Forest Communities		
Mesic Deciduous Forest	Yes	Mesic deciduous forest occurs in the project area.
Spruce-fir Forest	No	None of this habitat type occurs within the project area.
Eastern Hemlock and White Pine Forest	Yes	Eastern hemlock and White pine forest occurs in the project area.
Oak and Oak-pine Forest	Yes	Oak and Oak-pine forest occurs in the project area.
Pine and Pine-oak Forest	Yes	Pine and Pine-oak forest occurs in or immediately adjacent to the project area.
Woodlands, Savannas, and Grasslands	Yes	Acres are available for the creation of this habitat type in the project area.
Rare Communities		
Wetland Communities	Yes	Wetland communities occur in the project area.
Barrens, Glades, and Associated Woodlands	No	None of this habitat type occurs within the project area.
Carolina Hemlock Forests	No	None of this habitat type occurs within the project area.
Table Mountain Pine Forests	No	None of this habitat type occurs within the project area.
Basic Mesic Forests	No	None of this habitat type occurs within the project area.
Beech Gap Forests	No	None of this habitat type occurs within the project area.
Rock Outcrops and Cliffs (includes forested boulderfields)	Yes	Rock outcrops and cliffs (includes forested boulderfields) occur in the project area.
High Elevation Balds and Meadows	Yes	High elevation balds and meadows occur in the project area
Caves and Mines	No	No caves or mines are known to occur in the project area.
Successional Habitats		
Successional Forested Habitats	Yes	Successional forested habitats occur in the project area.
High Elevation Early Successional Habitats	Yes	High elevation early-successional habitats occur in the project area.
Permanent openings and old fields, Rights-of way, Improved pasture	Yes	Permanent openings and old fields, rights-of-way, and improved pasture occur in the project area.
Forest Interior Birds	No	The project area is not identified in the RLRMP EIS as an area where

Table 3. Elements of the biological environment, derived from Forest plan analysis, and their relevance to the Middle and Upper Tellico Watershed Assessment Area, Cherokee National Forest, Monroe County, Tennessee, 2009.

		forest fragmentation is an issue.
Old Growth	Yes	Old growth forests may occur in the project area.
Terrestrial Habitat Attributes		
Riparian Habitats	Yes	Riparian habitats occur in the project area.
Snags, Dens, and Downed Wood	Yes	Snags, dens, and downed wood occur in the project area.
Aquatic Habitats	Yes	Aquatic habitats occur in the project area.
Threatened and Endangered Species	Yes	Threatened and Endangered species are known to occur in the project area.
Demand Species	Yes	Demand species occur in the project area.
Migratory Birds	Yes	Migratory bird issues are closely tied to Major Forest Community types and Successional Forested Habitats. RLRMP objectives for these biological elements take into consideration migratory bird requirements.
Invasive Non-native Plants and Animals	Yes	Invasive non-natives plants and animals occur in the project area.
Species Viability	Yes	Numerous species of viability concern occur in the project area.
Forest Health	Yes	

Major Forest Communities

The Middle and Upper Tellico watershed assessment area includes approximately 29,000 acres of Forest Service ownership according to GIS data. The RLRMP categorizes forest stand types from the FSVEG database into major forest community types (USDA 2004a). Nine major forest community types have been identiifed on the CNF (Table 4). The RLRMP EIS further groups these 9 forest community types into 5 forest community types to facilitate wildlife management activities (USDA 2004b). Four of these forest community types are found in the assessment area and include Mesic deciduous forests (12,218 acres), eastern hemlock and white pine forests (3,197 acres), oak and oak-pine forests (7,886 acres), and pine and pine-oak forests (9,932 acres) (Table 5). The acreage and percentage totals of the major forested communities exceed 29,000 acres and 100%, respectively, because some forest types can be a component of more then one forest community type.

Table 4. Forest community types, as defined in the 2004 Revised Land and Resource Management Plan, found on the Cherokee National Forest, Tennessee, 2009.

Major Forest Community Type	Forest Type(s)	Acres (in 2004)
Northern Hardwood Forest	Sugar maple-Beech-Yellow birch (81),Black birch (83)	18,516
Montane Spruce-Fir Forest	Fraser fir (6), Red spruce-Fraser fir (7), Red spruce-Northern hardwood (17)	647
Mixed Mesophytic-Hardwood Forest	Cove hardwood-White pine-Hemlock (41), Yellow poplar (50), Yellow poplar-White oak-Red oak (56), Black Locust (88)	138,858
Conifer-Northern Hardwood Forest	White pine (3), White pine-Hemlock (4), Hemlock (5), Hemlock-Hardwood (8), White pine-Cove hardwood (9), White pine-Upland hardwoods (10).	52,072
Dry to Mesic Oak Forest	Post oak-Black oak (51), White oak-Red oak-Hickory (53), White oak (54), Northern red oak-Hickory (55).	125,189
Dry and Dry-Mesic Oak-Pine Forest	Upland hardwoods-White pine (42), Southern red oak-Yellow pine (44), Chestnut oak-Scarlet oak-Yellow pine (45), Bottomland hardwoods-Yellow pine (46), White oak-Black oak-Yellow pine (47), Northern red oak-Hickory-Yellow pine (48).	56,465
Dry and Xeric Oak Forest	Chestnut oak (52), Scarlet oak (59), Chestnut oak-Scarlet oak (60).	69,984
Xeric Pine and Pine-Oak Forest	Shortleaf pine-oaks (12), Loblolly pine/hardwood (13), Pitch pine-oaks (15), Virginia pine-oaks (16), Table-mountain pine-Hardwoods (20), Shortleaf pine (32), Loblolly pine (31), Virginia pine (33), Spruce pine (37), Pitch pine (38), Table-mountain pine (39).	140,872
Eastern Riverfront and River Floodplain Hardwood Forests	Sweetgum-Yellow poplar (58), River birch-Sycamore (72), Sweetgum-nuttall oak-willow oak (62), Black Walnut (82)	1,086

Table 5. Forest community types, as defined in the 2004 Final Environmental Impact Statement for the Revised Land and Resource Management Plan, found in the Middle and Upper Tellico Watershed Assessment Area, Cherokee National Forest, Monroe County, Tennessee, 2009.

Major Forest Community Type	Forest Type(s)	Acres
Mesic Deciduous Forest	Loblolly pine-Hardwood (13), Cove hardwood-White pine-Hemlock (41), Bottomland hardwoods-Yellow pine (46), Yellow poplar (50), Post oak-Black oak (51), White oak-Red oak-Hickory (53), White oak (54), Northern red oak (55), Yellow poplar-White oak-Red oak (56), Sweetgum-Yellow poplar (58), River birch-Sycamore (72), Sugar maple-Beech-Yellow birch (81).	12,218
Spruce-Fir Forest	Fraser fir (6), Red spruce-Fraser fir (7), Red spruce-Northern hardwood (17).	0
Eastern Hemlock & White Pine Forest	White pine (3), White pine-Hemlock (4), Hemlock (5), Hemlock-Hardwood (8), White pine-Cove	3,197

Table 5. Forest community types, as defined in the 2004 Final Environmental Impact Statement for the Revised Land and Resource Management Plan, found in the Middle and Upper Tellico Watershed Assessment Area, Cherokee National Forest, Monroe County, Tennessee, 2009.

	hardwood (9), White pine-Upland hardwoods (10), Upland hardwoods-White pine (42).	
Oak & Oak-Pine Forest	Southern red oak-Yellow pine (44), Chestnut oak-Scarlet oak-Yellow pine (45), White oak-Black oak-Yellow pine (47), Northern red oak-Hickory-Yellow pine (48), Post oak-Black oak (51), White oak-Red oak-Hickory (53), White oak (54), Northern red oak (55), Scarlet oak (59), Chestnut oak-Scarlet oak (60).	7,886
Pine & Pine-Oak Forest	Shortleaf pine-Oaks (12), Loblolly pine/hardwood (13), Pitch pine-Oaks (15), Virginia pine-Oaks (16), Table mountain pine-Hardwoods (20), Loblolly pine (31), Shortleaf pine (32), Virginia pine (33), Pitch pine (38), Table mountain pine (39).	9,932

Existing Condition

Mesic Deciduous Forests

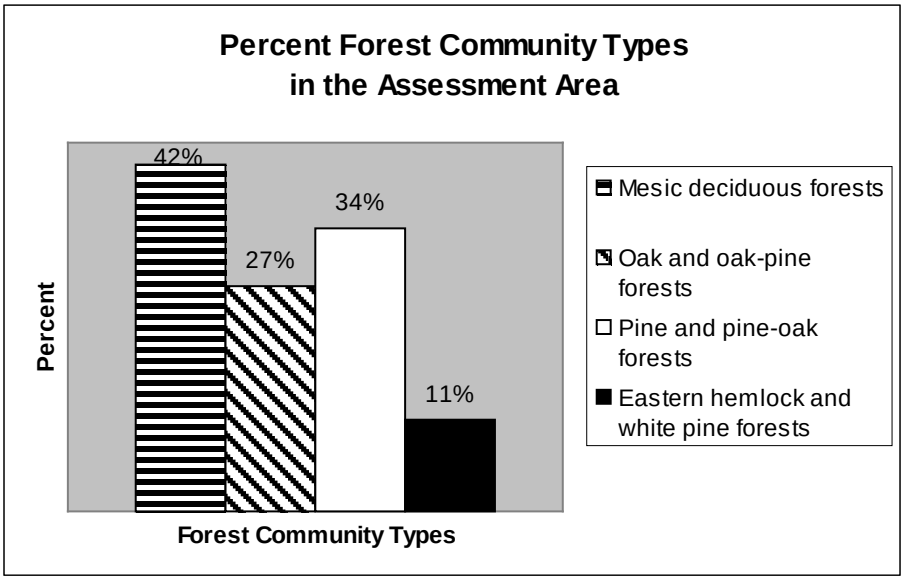
Mesic deciduous forests as defined in the RLRMP include northern hardwood, mixed mesophytic, and bottomland hardwood community types, as well as the dry-mesic oak forest communities. These forest types are characterized by relatively low levels of disturbance, and from a habitat perspective, their primary value is providing habitat for a variety of species dependent on mid- and late-successional forest stages. A number of bird species, including the cerulean warbler (*Dendroica cerulea*) favor mature, mesic hardwood forests with a diverse and well-developed canopy structure including canopy gaps and associated midstory and understory structural diversity. This structural diversity may be characteristic of the decadent, patchy conditions found in old growth forests, to which these species have presumably adapted. While a growing portion of the landscape in the southern Appalachians consists of large hardwoods, most sites have very simple canopy structures. This lack of structure is likely the result of previous even-aged timber management, resulting in forest stands of approximately equally-aged trees with low mortality and few canopy gaps. Most of these mid- and late-successional forests have not yet begun to develop the canopy gaps characteristic of old growth forests. It may be many centuries before such structure develops through natural succession (USDA 2004b).

Mesic deciduous forests are abundant and well distributed, comprising 283,088 acres (44 percent) on the CNF. The best, most clustered distributions are found at higher elevations of the Tellico Ranger District and Big Frog Mountain, followed by Big Bald, Unaka, Roan, Pond and Holston Mountains and Rogers Ridge. Poorest distributions are found on the pine dominated Starr and Chilhowee Mountains (USDA 2004b).

Mesic deciduous forests comprise 42% (12,218 acres) of the assessment area and is the most abundant forest community type (Figure 7). In the assessment area, mesic deciduous forest consists of 6 forest types in order of prevalence: yellow poplar-white oak-red oak (4,374 acres), white oak-red oak-hickory (4,094 acres), cove hardwood-white pine-hemlock (1,992 acres),

yellow poplar (792 acres), sugar maple-beech-yellow birch (631 acres), and northern red oak (335 acres).

Figure 7. Forest community type composition of the Middle and Upper Tellico Watershed Assessment Area, Cherokee National Forest, Monroe County, Tennessee, 2009.



Eastern Hemlock and White Pine Forests

Eastern hemlock (*Tsuga canadensis*) and white pine (*Pinus strobus*) forests are broadly defined to include those forested communities that are either dominated or co-dominated by eastern hemlock or white pine in the canopy. For the purposes of this analysis, forests with a significant component of eastern hemlock are classified as hemlock forests, even where white pine may be dominant. White pine forests include all other forests where white pine is dominant. This division puts priority on the presence of hemlock as a key habitat component (USDA 2004b).

Eastern hemlock forests typically occur on acidic soils and often have a dense shrub layer composed of ericaceous species. These communities are typically low in herbaceous diversity, but may support rich bryophyte communities. White pine forests occupy similar sites but also may occur on dryer locations, particularly in areas where fire has been suppressed. White pine forests have also been artificially created as timber plantations (USDA 2004b).

The combination of a largely evergreen canopy and a dense midstory in naturally occurring hemlock and white pine forests provide for a variety of benefits. Benefits include shading and cooling of riparian systems, thermal cover for wildlife, and nesting and foraging habitat for several species of neotropical migrant birds dependent upon the layered canopy structure and understory thickets. There is some evidence that hemlock-white pine forests provide necessary habitat components for the long-term conservation of red crossbills (*Loxia curvirostra*) (USDA 2004b).

Eastern hemlock forests may also be important refugia for species typically adapted to higher elevations. Red-breasted nuthatches (*Sitta canadensis*), winter wrens (*Troglodytes troglodytes*), and golden-crowned kinglets (*Regulus satrapa*) are found in late successional hemlock forests

down to elevations of 2,000 feet. Several species of rare bryophytes that are known to occur primarily within the spruce/fir zone are also found at lower elevations in humid gorges often under a canopy that includes eastern hemlock. The current amount and distribution of mature eastern hemlock forests is threatened by the recent emergence of the hemlock woolly adelgid (*Adelges tsugae*) in the southern Appalachians. First identified in the eastern U.S. near Richmond, VA in the early 1950's, this exotic pest has recently spread into the southern Appalachians and threatens to spread throughout the range causing mortality within five years after initial infestation (USDA 2004b).

On the CNF, eastern hemlock forests are found primarily in association with north facing coves and slopes and riparian systems. Years of fire suppression have allowed individual hemlocks and white pine to creep upslope onto more xeric slopes and ridges where they would not likely exist under a natural fire regime. Based upon data from the FEIS for the RLRMP, eastern hemlock and white pine forests occupy 52,072 acres on the CNF (USDA 2004b).

The eastern hemlock and white pine forest community comprises 11% of the assessment area and is the least abundant forest community type (Figure 7). This consists predominantly of white pine dominated forest types (2,688 acres) and only 509 acres of eastern hemlock-hardwood forest.

Oak and Oak-Pine Forests

Oak dominated forests covered under this section include dry to mesic oak and oak-pine forests. Dry-mesic oak forests vary greatly in their species composition due to their wide distribution and are also a component of the mesic deciduous forest community type. The major species include chestnut oak (*Quercus montana*), northern red oak (*Q. rubra*), black oak (*Q. velutina*), white oak (*Q. alba*), and scarlet oak (*Q. coccinea*). The dry to mesic oak-pine forests considered here are oak-dominated forests containing a significant pine component. Predominant pine species include white pine, shortleaf pine (*Pinus echinata*), Virginia pine (*P. virginiana*), and loblolly pine (*P. taeda*). In the southern U.S., acres of oak-hickory and oak-pine forests have increased over the last 50 years. Oak and oak-pine forests are common throughout the South, comprising over half of the timberland of the region as a whole. Oak-hickory forests are the dominant forest type in the Southern Appalachian Ecoregion (USDA 2004b).

Oak forests are abundant on the CNF, comprising 251,638 acres or 36 percent of the forest acreage. These forests are very well distributed within the northern portion of the CNF. Oak forests are less evenly distributed on the southern CNF, especially along the pine-dominated lower elevations including Starr Mountain and the lower Citico Creek drainage; and in the highest elevations, where mesic deciduous forest types predominate (USDA 2004b).

Oak and oak-pine forests comprise 27% of the assessment area (Figure 7). In the assessment area, oak and oak-pine forest consists of 7 forest types in order of prevalence: White oak-red oak-hickory (4,094 acres), chestnut oak-scarlet oak (1,172 acres), chestnut oak-scarlet oak-yellow pine (1040 acres), chestnut oak (1,015 acres), northern red oak (335 acres), scarlet oak (136 acres), and white oak-red oak-hickory-yellow pine (94 acres).

Pine and Pine-Oak Forests

Pine dominated forests covered in this section include all "Southern Yellow Pine" forest types with various mixtures of hardwood species occurring as minor components. These forests occur

on a variety of landforms at a wide range of elevations. Historically, in the Blue Ridge Physiographic Province, these communities occupied areas that were subject to natural fire regimes and typically occurred on ridges and slopes with southern exposures. However, due to a combination of previous land use, fire exclusion, and intensive forestry (plantations), many pine species have expanded beyond their natural range and today, pine-dominated communities can be found on virtually all landforms and aspects. Based upon data from the FEIS for the RLRMP, pine and pine-oak forests occupy 140,872 acres on the CNF (USDA 2004b).

Pine and pine-oak forests comprise 34% of the assessment area and are the second most abundant forest community type (Figure 7). In the assessment area, pine and pine-oak forest consist of 8 different forest stand types. Virginia pine (3,409 acres), pitch pine (2,711 acres), pitch pine-oak (1,489 acres), and Virginia pine-oak (1,105 acres) are the most abundant forest stand types. A major portion of the pine in the assessment area was impacted by the latest Southern pine beetle (SPB) outbreak. Much of the overstory was killed and some of it is being restored through slashdown, burning and planting shortleaf pine.

Woodlands, Savannas, and Grasslands

Complexes of woodlands, savannas, and grasslands were once a frequent occurrence across portions of the southeastern landscape, primarily in the Piedmont and Coastal Plain provinces (USDA 2004b). Smaller occurrences likely occurred in the southern Appalachians on xeric ridge-tops and south-facing slopes where they were maintained by frequent fire. Woodlands are open stands of trees, generally forming 25 to 60 percent canopy closure and may be of pine, hardwood (typically oak), or mixed composition. Savannas are usually defined as having lower tree densities than woodlands; grasslands are mostly devoid of trees. All of these conditions typically occurred in mixed mosaics within a fire-maintained landscape. In all cases, a well-developed grassy or herbaceous understory is present.

Some woodland habitat may have been created during the recent SPB outbreak which eliminated or greatly reduced the pine overstory of some forest stands. However, Virginia and white pine, as well as other hardwood tree species quickly colonize these open habitat conditions. Without the application of prescribed fire and/or mechanical slashdowns, these woodland conditions will not persist.

Savannas are not known to occur in this area. Without frequent and intense fire or intensive mechanical treatments, savannas can not be created or maintained. Presently, the creation of savannas is not a practical management activity.

There are very few grassland habitats known to occur on forest Service ownership in the assessment area. This includes the Whigg Meadow high elevation bald community, considered to be part of the Haw Knob rare community. These areas are discussed further in the rare communities section of this document.

Desired Future Condition

Mesic Deciduous Forests

Existing mesic deciduous forest in the assessment area is predominantly in older age classes. Ninety-four percent (11,540 acres) is over 40 years old and of this 83% is greater than 80 years old. Due to past timber management practices, these older forests are low in structural diversity.

A more desirable condition would be a diverse and well-developed canopy structure including canopy gaps and associated midstory and understory structural diversity.

Eastern Hemlock and White Pine Forests

Hemlock and white pine forests would be managed to optimize their natural distribution, abundance, and condition. Eastern hemlock forests are naturally limited in distribution, occurring primarily in association with north facing coves and slopes and riparian systems. The RLRMP includes Forestwide Standards that defer existing hemlock forests from regeneration cutting during this plan period and that maintain the hemlock component where it occurs as patches within other forest types. These provisions are included in an effort to maintain mature hemlock forests in the face of threats to this type from the hemlock woolly adelgid. This would also increase abundance of mature hemlock forest with the desired multi-layered canopy condition that is needed by many species of wildlife (USDA 2004b).

White pine plantations would be restored back to diverse native communities appropriate to the site. In addition, with a renewed emphasis of introducing fire onto the landscape in areas where natural fire may have played a role in shaping historic vegetative patterns, it is likely that white pine distributions would shrink from areas where it has been able to become established in the absence of fire (USDA 2004b).

There are 33 species of plants and animals with viability concerns that are associated with mature hemlock forests across the southern Appalachian area. Thirteen of these species are of concern on the CNF. Increasing the natural distribution of hemlock and white pine forest communities should contribute to the viability of these associated species (USDA 2004b).

Oak and Oak-Pine Forests

There are 4 primary concerns for the desired future condition of oak and oak-pine forests. These include oak dominance and regeneration, restoration, hard mast (acorn) production and den site availability, and forest insect and disease threats. The future abundance of oak and oak-pine forests is primarily related to the maintenance of stand conditions that ensure oak dominance and regeneration, and to the restoration of oaks or oak-pine forests on appropriate sites currently occupied by pine plantations or other hardwood species such as gum and maple. Acorns are a critical fall and winter food for numerous wildlife species. Mast production is greatest in mid and late successional oak forests and the large diameter hollow trees and snags found in these older oak forests also are an important source of dens for black bears (*Ursus americanus*). There are a number of viability concern species that are associated with open canopy condition and moderate levels of prescribed burning in dry to mesic oak forests. Treatments such as shelterwood harvest, moderate thinning, or basal area reduction from below using herbicides, combined with prescribed burning have been shown to create conditions that promote adequate oak regeneration, create the desired habitat conditions in closed canopy oak forests, and offset the impacts of these insects and diseases. Further discussion of insect and disease threats is found under the Forest Health section.

Pine and Pine-Oak Forests

This community was likely a common component of the historical landscape, but has been greatly reduced in distribution by recent SPB infestations and long-term fire exclusion. Restoration of mature forests with natural species assemblages, especially on pine plantations, is

a priority. Longer rotation ages coupled with more frequent prescribed fire will enhance habitat attributes such as a grassy understory and standing snags. This will increase the importance and value of these habitats to species of viability concern

Woodlands, Savannas, and Grasslands

Because of their rarity, existing remnants of grassland communities that support significant populations or assemblages of rare species are managed under the Rare Community Prescription (9.F). Similarly, existing woodland conditions associated with glades and barrens are also included under Prescription 9.F. This Prescription provides priority for protection and maintenance of these sites. Therefore, these sites are expected to be sustained for the foreseeable future.

The RLRMP includes objectives for restoring complexes of woodlands, savannas, and grasslands to fire-maintained landscapes. Desired conditions include heterogeneous canopy coverage averaging 25 to 60 percent, and dense grass and herbaceous ground layers. Scattered patches may be devoid of canopy to provide for interspersed savanna and grassland conditions. Restoration activities may include thinning of trees (generally to less than 60 $ft.^2$ of basal area per acre) and prescribed burning. Prescribed fire on relatively short rotations (1 to 3 years) typically would be used to maintain desired conditions, and may involve both dormant and growing season burns.

Opportunities

Mesic Deciduous Forests

There are approximately 1,458 acres of mid to late successional mesic deciduous forest in Prescriptions 7, 8, and 9 within ½ mile of a mapped road in the assessment area that could be targeted to achieve Objective 12.02.

Eastern Hemlock and White Pine Forests

Forestwide Standard FW-60 states: “Forests dominated by eastern hemlock will not be subjected to regeneration harvest. Hemlock will be retained as patches (A minimum or 0.25 acres) during all silvicultural treatments.”

There are approximately 172 acres of white pine plantations (white pine less then 30 years of age) in Prescriptions 7, 8, and 9 in the assessment area that could be targeted to achieve Objective 17.01.

Oak and Oak-Pine Forests

Several RLRMP objectives focus on the oak and oak-pine forest community:

- There are currently approximately 1,404 acres of stands less then 30 years of age of all forest types within established burn blocks in Prescriptions 7, 8, and 9 in the assessment area that should be evaluated to achieve Objective 17.02.
- There are approximately 1,560 acres of xeric oak and pine-oak forest within established burn blocks and within Prescriptions 7, 8, or 9 in the assessment area that should be evaluated to achieve Objective 17.06.

- Evaluate existing oak and oak-pine forest stands to determine forest health.
- There are approximately 2,949 acres of oak and oak-pine forest within established burn blocks and within Prescriptions 7, 8, or 9 in the assessment area that should be evaluated to achieve Objective 21.02.
- There are approximately 533 acres of dry and xeric oak forests within established burn blocks in Prescriptions 7, 8, or 9 in the assessment area that should be evaluated to achieve Objective 21.03.
- Additionally, oak and other mast producing species are likely responding to the increased light as a result of pine death that occurred from the latest SPB outbreak, resulting in increased oak regeneration. Managing these stands to promote advanced oak regeneration could increase the hard mast component in the assessment area.

Pine and Pine-Oak Forests

Several RLRMP objectives focus on the pine and pine-oak forest community:

- There are approximately 1,712 acres of shortleaf/pitch/table-mountain pine forest within established burn blocks and within Prescriptions 7, 8, or 9 in the assessment area that should be evaluated to achieve Objective 17.03.
- There are no acres of loblolly pine forest less then 30 years of age in Prescriptions 7, 8, or 9 in the assessment area.
- There are approximately 1,670 acres of Virginia pine and Virginia pine-oak forest within established burn blocks and within Prescriptions 7, 8, or 9 in the assessment area that should be evaluated to achieve Objective 17.05.
- There are approximately 1,560 acres of xeric oak and pine-oak forest within established burn blocks and within Prescriptions 7, 8, or 9 in the assessment area that should be evaluated to achieve Objective 17.06.
- There are 1,005 acres of shortleaf and pitch pine forest within established burn blocks, within ½ mile of a road, not in a southern pine beetle disturbed area, and with a slope of less then 30% in the assessment area that should be evaluated to achieve Objective 17.08.
- There are approximately 1,712 acres of shortleaf/pitch/table-mountain pine forest within established burn blocks, within ½ mile of a road and within Prescriptions 7, 8, or 9 in the assessment area that should be evaluated to achieve Objective 21.01.
- There are approximately 1,033 acres of pine-oak forest within established burn blocks and within Prescriptions 7, 8, or 9 in the assessment area that should be evaluated to achieve Objective 21.04.

Woodlands, Savannas, and Grasslands

Two RLRMP objectives focus on the woodlands, savannas, and grasslands:

There are approximately 1,560 acres of xeric oak and pine-oak forest within established burn blocks and within Prescriptions 7, 8, or 9 in the assessment area that should be evaluated to achieve Objective 17.06.

There are approximately 533 acres of dry and xeric oak forests within established burn blocks and within Prescriptions 7, 8, or 9 in the assessment area that should be evaluated to achieve Objective 21.03.

Additionally, there is a good opportunity to develop woodlands in the Middle and Upper Tellico Watershed Assessment area. Much of the area was impacted by the SPB outbreak resulting in the mortality of the pine overstory. With continued prescribed burning and/or mechanical slashdown treatments woodland conditions could be created.

Recommendations/Priorities

Mesic Deciduous Forests

Stands identified based on RLRMP objectives focusing on mesic deciduous forests should be evaluated for implementation during development of project level activities.

Eastern Hemlock and White Pine Forests

Identify forest stands dominated by eastern hemlock (including patches as small as 0.25 acres), which will be "excluded from all silvicultural treatments."

Stands identified based on RLRMP objectives focusing on white pine forests should be evaluated for implementation during development of project level activities.

Oak and Oak-Pine Forests

Stands identified based on RLRMP objectives focusing on oak and oak-pine forests should be evaluated for implementation during development of project level activities.

Evaluate existing oak and oak-pine forest stands to determine forest health.

Evaluate forest stands impacted by SPB mortality to determine suitability for promoting advanced oak regeneration.

Pine and Pine-Oak Forests

Stands identified based on RLRMP objectives focusing on pine and pine-oak forests should be evaluated for implementation during development of project level activities.

Woodlands, Savannas, and Grasslands

Stands identified based on RLRMP objectives focusing on woodlands, savannas, and grasslands should be evaluated for implementation during development of project level activities.

Evaluate forest stands impacted by SPB mortality to determine suitability for promoting woodland creation.

Rare Communities

Existing Condition

Wetland Communities

There are numerous occurrences of small, unmapped wetland communities on the CNF, most being associated with river and stream terraces. There are likely some wetlands of this category

in the assessment area. Most large wetland complexes have been mapped and are designated in the RLRMP as rare communities. Smaller occurrences that meet the rare community definitions provided in the RLRMP will be managed under the rare community prescription as they are found.

Rock Outcrops and Cliffs, and Forested Boulderfields

Rock outcrops occur across the forest and are evident within the assessment area. While there are no rock outcrops and cliffs that are currently designated as rare communities within the assessment area, any rock outcrops and cliffs meeting the rare community definitions provided in the RLRMP will be managed under the rare community prescription as they are found.

The Haw Knob rare community extends into the eastern portion of the Upper Tellico watershed and this area contains extensive forested boulderfields intermixed with northern hardwood forest types. The forested boulderfields are of the "Southern Appalachian Hardwood Boulderfield Forest (Typic Type)" as classified by NatureServe (CEGL004982) and are a designated rare community type in the RLRMP.

High Elevation Balds and Meadows

The Haw Knob rare community includes the Whigg Meadow and Haw Knob high elevation bald communities. Both of these balds are likely of human origin created by grazing and possibly burning. Grassy balds and high elevation meadows play an important role in supporting biodiversity. The grassy bald at Whigg Meadow is classified by the National Plant Community Classification as a *Danthonia compressa* –(*Sibbaldiopsis tridentata*) herbaceous vegetation grassy bald (Southern grass type) – CEGL004242. The community is ranked as G1-Critically imperiled. These vital resources are rapidly declining range-wide due to woody plant invasion and will require active recovery and long-term management if they are to survive. The protection and enhancement of this resource will meet the goals of the Forest Plan by preserving the significant visual resource for recreationists, conserving the unique plant and animal communities, and protecting and preserving populations of rare species.

Approximately 6 acres of actual grassy opening remains at Whigg Meadow and is currently maintained by mowing. Haw Knob is now completely enclosed with trees. Whigg was once a much larger opening of 30-40 acres or more (estimates vary). Whigg Meadow is currently dominated by a mixture of native and introduced grass species.

Desired Future Condition

Rare communities are assemblages of plants and animals that occupy a small proportion of the landscape, but contribute significantly to the plant and animal diversity. The desired future condition for rare communities is that they exhibit the composition, structure, and function necessary to support healthy and vigorous populations of species characteristic of the community, especially species of viability concern. These sites should be in excellent ecological condition and free from external threats. It is hoped that natural forces are sufficient to maintain these conditions, however, in some cases environmental conditions will have changed to the extent that natural processes may need to be augmented. In these cases, management activities such as prescribed burning or other vegetative manipulations may be evident.

A Conservation Strategy was prepared for grassy balds including Whigg Meadow in 2001 and states that "several goals should be considered [for each site] that includes maintenance and

enhancement of current opening, reduction of woody species encroachment, reduction of non-native species and overall species composition." In 2007 an assessment of threats to the twenty-six rare communities mapped in the RLRMP was completed (Griggs 2007). Information from that report may be useful in determining additional needs within rare communities in the watershed.

Opportunities/ Recommendations

High Elevation Balds and Meadows

The conservation strategy developed for Whigg Meadow in 2001 includes a description of the desired future condition for this site including species assemblages.

There is an opportunity to expand and enhance the opening at Whigg Meadow. Historical aerial photos, oral history and conditions on site estimate the size of the grassy opening at 30-40 acres or larger. The current grassy opening is surrounded by blackberry, blueberry and small hardwood stems typical of an early successional stage. The area of small diameter trees indicating the historical opening was measured with a GPS unit and determined to be about 40 acres. Seeps and other areas not appropriate for management were not included in the measurement.

To expand the opening, the following steps are proposed:

1. Mechanical treatments – Using a gyrotrac or other similar device, cut smaller diameter stems surrounding the current opening. For the first year, avoid cutting the blackberry and blueberry. Those species are popular with berry pickers and occur about 50 yards from the edge of the opening.
2. Prescribed fire – Use prescribed fire in the late growing season the first year after the mechanical treatments. This will reduce the mulching effect of cutting, reduce sprouting of hardwood stems and stimulate desirable native species. More prescribed burning should be done in subsequent years at various times of the year depending on the vegetation response. Fire breaks around the berries may be needed initially.
3. Herbicide – Use herbicides to further reduce hardwood sprouting and reduce exotic species in the opening.

As blackberries and blueberries become established at the edges of the opening, the current plants could be eliminated. This would actually increase the number of berries available.

Monitoring should be done before and after treatments to determine the effects of the management. In addition, signage should be posted to interpret the management to the public.

There is also an opportunity to partner with universities and other groups to coordinate the expansion and monitoring of management actions at Whigg. The endeavor would make an excellent Master's level project were funding available. Consult with knowledgeable partners and develop a management plan and associated budget to achieve the desired future condition.

Successional Habitats

Existing Condition

Successional Forested Habitats

This section deals only with successional forest conditions. Permanent openings such as open woodlands, savannas, grasslands, barrens and glades, balds, wildlife openings, old fields, pastures, and rights-of-way are covered elsewhere in this document. Old growth conditions are covered only generally in this section; more detailed analysis is presented in the Old Growth element section of this document.

Forest age and related structure are key determining factors for presence, distribution, and abundance of a wide variety of wildlife. Some species depend on early-successional habitats, some depend on late-successional habitats, and others depend on a mix of both occurring within the landscape. These habitat conditions are also important as wintering and stopover habitats for migrating species. In order to support viability of diverse plant and animal populations and to support demand for game species, a variety of habitat types are needed within national forest landscapes (USDA 2004b).

For analysis purposes, forest succession is divided into four stages: early, sapling/pole, mid, and late (Table 6). Early-successional forest is defined as regenerating forest of 0-10 years of age for all forest community types. It is characterized by dominance of woody growth of regenerating trees and shrubs, often with a significant grass/forb component, and relatively low density or absent overstory. This condition is distinguished from most permanent opening habitats by dominance of relatively dense woody vegetation, as opposed to dominance of grasses and forbs. Such conditions may be created by even-aged and two-aged regeneration cutting, and by natural disturbance events, such as windstorms, severe wildfire, and some insect or disease outbreaks.

Ages defining the remaining successional stages vary slightly by forest community type. Sapling/pole forest is characterized by canopy closure of dense tree regeneration, with tree diameters typically smaller than 10 inches. Mid-successional forest begins to develop stratification of over-, mid-, and understory layers. Late-successional forests are usually greater than 80 years old. The old growth stage contains the largest trees and often has many well developed canopy layers, scattered openings caused by tree mortality, and an abundance of dead and downed wood (USDA 2004b).

Table 6. Forest age (years) corresponding to successional stages for each forest community type, and total acres of each successional stage in the Upper and Middle Tellico Watershed Assessment Area, Cherokee National Forest, Monroe County, Tennessee, 2009.

Forest Community Type[1]	Successional Stage			
	Early	Sapling/Pole	Mid	Late
Northern Hardwood Forest	0-10	11-40	41-80	81+
Conifer-Northern Hardwood Forest	0-10	11-40	41-80	81+
Mixed Mesophytic-Hardwood Forest	0-10	11-40	41-80	81+
River Floodplain Hardwood Forest	0-10	11-20	21-60	81+

Table 6. Forest age (years) corresponding to successional stages for each forest community type, and total acres of each successional stage in the Upper and Middle Tellico Watershed Assessment Area, Cherokee National Forest, Monroe County, Tennessee, 2009.

Dry-Mesic Oak Forest	0-10	11-40	41-80	81+
Dry and Xeric Oak Forest; Woodland & Savanna Dry	0-10	11-40	41-80	81+
Xeric Pine & Pine-Oak Forest & Woodland	0-10	11-40	41-80	81+
Dry and Dry-Mesic Oak-Pine Forest	0-10	11-40	41-80	81+
Montane Spruce-Fir Forest	0-10	11-40	41-80	81+
Total Acres in Assessment Area	645	4450	6174	17535

1 = Major forest community types as outlined in the 2004 Revised Land and Resource Management Plan, Cherokee National Forest (USDA Forest Service 2004a).
Of particular importance as habitat are forest conditions that exist at both extremes of the forest successional continuum – early-successional and late-successional/old growth forests. Early-successional forests are important because they are highly productive in terms of forage, diversity of food sources, insect production, nesting and escape cover, and soft mast. Early-successional forests have the shortest lifespan (10 years) of any of the forest successional stages, and are typically in short supply and declining on national forests in the Southern Appalachians and in the eastern United States. Early-successional forests are also not distributed regularly or randomly across the landscape. These habitats are essential or beneficial for some birds (ruffed grouse (*Boasa umbellus*), chestnut-sided warbler (*Dendroica pensylvanica*), golden-winged warbler (*Vermivora chrysoptera*), prairie warbler (*Dendroica discolor)*, yellow-breasted chat (*Icteria virens*), blue-winged warbler (*Vermivora pinus*)); beneficial to white-tailed deer (*Odocoileus virginianus*), eastern wild turkey (*Meleagris gallopavo*), and black bear in the South; and sought by hunters, berry pickers, crafters, and herb gatherers for the opportunities they provide. Many species commonly associated with late-successional forest conditions also use early-successional forests periodically, or depend upon it during some portion of their life cycle (USDA 2004b).

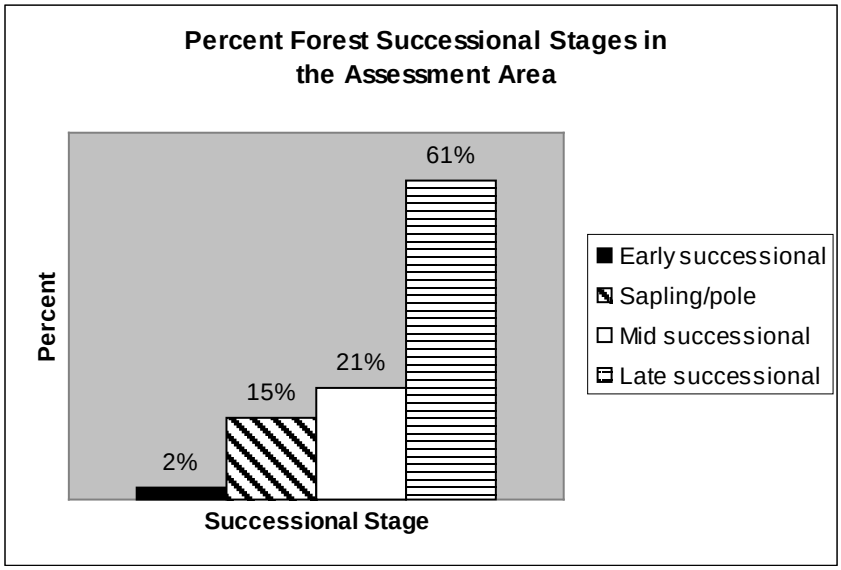
Like early-successional forests, late-successional forests provide habitats and food supplies for a suite of habitat specialists as well as habitat generalists. These habitats are important providers of high canopy nesting, roosting, and foraging habitat, suitable tree diameters for cavity development and excavation, and relatively large volumes of seed and hard mast. Although it takes many decades for late-successional forest conditions to develop, these habitats are more common and contiguous across the national forest and are dominant features in the Southern Appalachians (USDA 2004b).

Sapling/pole stages are generally of least value to wildlife because closed canopies limit understory development, and trees are not yet large and old enough to begin producing mast or other wildlife benefits. However, this successional stage does provide value as dense cover for some species. Mid-successional forests begin to look and function like late-successional forests, and provide habitat for many species that use late-successional forests. For most of these species however, mid-successional forests provide lower quality habitat than do late-successional forests (USDA 2004b).

Approximately 61% (17,535 acres) of the forest in the assessment area is currently greater then 80 years of age or considered late-successional (Figure 7). Early-successional forest (0-10 years) accounts for only 2% (645 acres) of the forest acres and this figure excludes acres affected by the SPB. Non-forest, which includes roads, water, and permanent openings, such as pastures, permanent wildlife openings, old fields, maintained rights-of-way, and balds, are not included in calculations of early-successional forest percentages. Woodlands, savannas, and grasslands, which will be managed for a relatively open condition on a permanent basis, also are not

included in these calculations. Sapling/pole and mid-successional forest accounts for 15% and 21% of the forest acres, respectively.

Figure 8. Percent of forest successional stages found in the Upper and Middle Tellico Watershed Assessment Area, Cherokee National Forest, Monroe County, Tennessee, 2009.



High Elevation Early Successional Habitats

While early-successional forest habitats are important for many species throughout the Southern Appalachian region, a relatively small but very specialized subset requires these habitats at high elevations, generally above 3000 feet. The limited and declining abundance of these habitats has put associated species at risk. These species include the New England cottontail (*Sylvilagus transitionalis*), common raven (*Corvus corax*), golden-winged warbler, Steeles joe-pye weed (*Eupatorium steelei*), cow parsnip (*Heracleum maximum*), and ground pine (*Lycopodium clavatum*). For the purposes of this analysis, high elevation early successional habitats are defined to include open woodlands, savannas, grasslands, old fields, and regenerating forests 0-10 years old (USDA 2004b).

High elevation early successional habitats have been declining due to succession of old fields, fire suppression, and reduced management intensity on national forest lands. Although abundance of these habitats likely peaked in the late 1800's along with farming at high elevations, evidence suggests some level of these habitats was present prior to European settlement due to the effects of burning by Native Americans, and grazing of American bison (*Bos bison*)and elk (*Cervus canadensis*). Current trends in populations of associated species such as golden-winged warblers and Appalachian Bewick's wren *(Thyromanes bewickii altu*s) suggest that these habitats are below desired levels of abundance needed to maintain the full complement of native species on NFS land (USDA 2004b).

Acreage of early-successional habitat at high elevations is used as an indicator of management effects on this habitat element. Currently on the CNF, there are approximately 6,910 acres of high elevation early-successional habitat, which represents 4% of the total Forest high elevation

acreage (167,421 acres). This figure does not include acreage of ROW, balds, and maintained openings along the Appalachian Trail (AT) and other locations (USDA 2004b).

Currently, on Forest Service owned lands in the Middle and Upper Tellico Watershed Assessment Area there are approximately 6,212 acres above 3,000 feet, and 152 acres of this is high elevation early-successional habitat. This total includes 135 acres of early-successional forest, 6 acres of grasslands (Whigg meadow), and 11 acres of maintained wildlife openings.

Permanent Openings and Old Fields, Rights of Way, Improved Pastures

Habitats considered here include permanent openings and old fields, utility rights-of-way, and improved pastures. Other early successional habitats such as woodlands, grasslands, and early successional forests are discussed in their respective bilogical element section.

Permanent Openings and Old Fields

There are approximately 1,517 acres of permanent maintained openings on the CNF. This represents 0.2 percent of the total national forest acres. Many were created by the expansion of log landings following timber harvest or by closing and seeding old roads to create linear openings. They are maintained with funding provided by the Tennessee Wildlife Resources Agency (TWRA), the Forest Service, and partners including the National Wild Turkey Federation (NWTF). Many are planted in non-native grass-clover mixtures, which include combinations of white or red clovers along with wheat, rye, oats, orchard grass, and ryegrass. Some of the older openings are dominated by fescue and/or annual weed species, and some of the recently renovated openings are planted to grain sorghum. Old fields acreage is currently unknown (USDA 2004b).

Currently, on Forest Service owned lands in the Middle and Upper Tellico Watershed Assessment area there are approximately 99.5 acres of maintained grassy wildlife openings. This includes 26 acres of spot openings and 73.5 acres of linear wildlife openings. Many of these are infested with non-native invasive species including fescue (*Festuca spp.*) and *Microstegium vimineum*.

Rights-of-Way and Improved Pasture

Utility ROWs and improved pastures typically are managed for purposes other than to provide wildlife habitat. However, they can provide wildlife benefits if managed appropriately. Rights-of-way can be established and maintained in plantings that enhance their benefits to wildlife. Once established, maintenance costs generally are reduced. There are approximately 1,300 acres of powerline ROW on the CNF. Right-of-way acreage was estimated by multiplying the existing 85 miles of powerline ROW known to the CNF by an average width of 125 feet. The majority of these support a mixture of herbaceous plants and shrubs and are maintained by a variety of methods. There are approximately 12 miles of high-voltage transmission line traversing the assessment area. There are currently, no known areas of improved pasture on FS lands in the Assessment area (USDA 2004b).

Old Growth

In June of 1997 a team chartered by the Southern Regional Forester completed a report entitled *Guidance for Conserving and Restoring Old-Growth Forest Communities on National Forests in the Southern Region*; hereafter, referred to as the “Regional Guidance Document” (Forest

Service 1997). Using this report as a guide, the CNF outlined an old growth strategy during Forest Plan revision. This strategy is listed in Appendix D to the 2004 RLRMP. The RLRMP lists three types of old growth: *Existing Old Growth* is defined by four criteria which include factors of age, basal area, diameter at breast height, and disturbance; *Possible Old Growth* is defined as forest stands that meet the minimum age requirement for a given old growth community type; and *Future Old Growth* is defined as those stands that do not necessarily exhibit old growth characteristics now, but are allocated to old growth through land management decisions (examples include allocations of wilderness and other management prescriptions that are designated as unsuitable for timber management including riparian areas.). No special allocations were made in the RLRMP to designate *existing old growth* areas, primarily because no existing stands had been inventoried that met the four criteria, and the allocation of the various management prescriptions was shown to provide for a significant amount of *future old growth* across the forest.

The table below provides data from new GIS queries run in 2008 on stands information that has been updated since the writing of the RLRMP. In order to see how the Middle and Upper Tellico watersheds contribute to the overall network of *future old growth* on the forest, data in the table is presented for both the entire forest and the watershed. Acres that meet the minimum age (*possible old growth*), as coded in GIS, are shown in parentheses as a subset of the *future old growth* category.

Table 7. Current Amounts of Future and Possible[1] Old Growth on the CNF and Middle and Upper Tellico Watersheds

Old Growth Community Type	Forest-wide Acres (all age classes)	Watershed Acres (all age classes)	Forest-Wide Acres of Future Old growth	Watershed Acres of Future Old growth	Forest-Wide % of Comm. Type in Future Old Growth	Watershed % of Comm. Type in Future Old Growth
Northern Hardwood Forest	19,025	637	16,436 (2,449)	635 (348)	86%	99%
Conifer-Northern Hardwood Forest	52,779	2,556	16,488 (710)	1,310 (53)	31%	51%
Mixed Mesophytic Hardwood Forest	143,031	6,745	75,658 (1,258)	3,662 (0)	53%	54%
Dry to Mesic Oak Forest	127,963	4,625	61,208 (2,636)	1,848 (0)	48%	40%
Dry and Xeric Oak Forest	70,813	2,003	34,093 (4,456)	1,681 (51)	48%	84%
Xeric Pine and Pine-Oak Forest	143,294	8,504	46,926 (3,271)	2,643 (12)	33%	31%
Dry and Dry-Mesic Oak-Pine Forest	60,501	1,383	24,253 (2,686)	610 (0)	40%	44%
Eastern Riverfront	872	0	600 (0)	0	69%	n/a

Table 7. Current Amounts of Future and Possible[1] Old Growth on the CNF and Middle and Upper Tellico Watersheds

and River Floodplain Hardwood Forests						
Montane Spruce-Fir Forest	723	0	723 (82)	0	100%	n/a
TOTAL	**619,001**	**26,453**	**276,385 (17,548)**	**12,389 (464)**	**45%**	**47%**

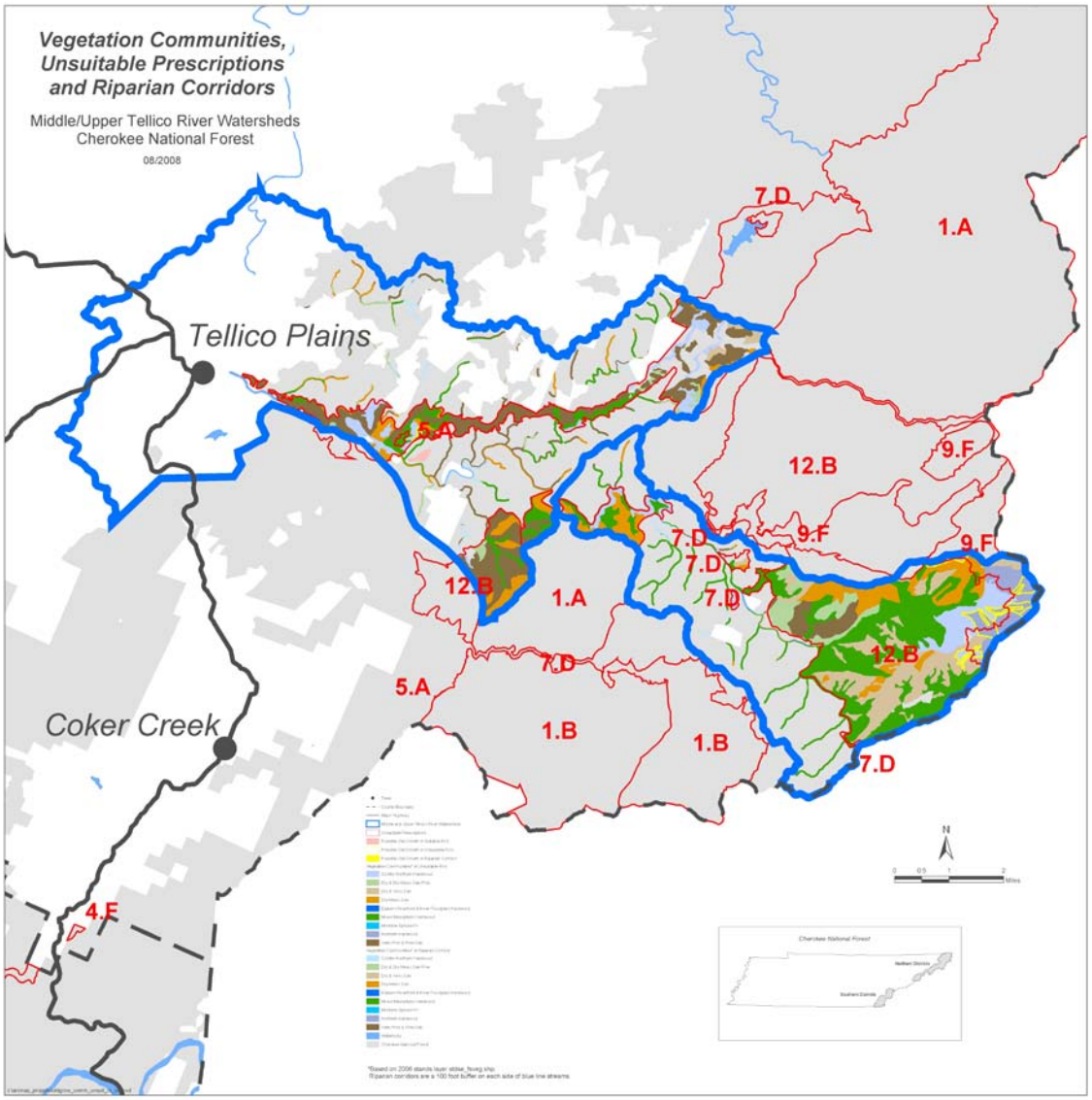
[1]Acres in parentheses are possible old growth within management prescriptions that are unsuitable for commercial timber management. Those acres meet the minimum age criterion for that old growth community type and are shown here as a subset of the future old growth category.

The following management prescriptions are designated as unsuitable for timber management: 1A, 1B, 2B1, 2B2, 2B3, 4A, 4E, 4F, 4K, 5A, 5B, 7A, 7D, 9F, 11, 12A, 12B.

All blue-line streams are given a buffer of 100 feet to each side (200' wide corridor) to approximate the unmapped riparian prescription (Rx 11).

A total of 12,389 acres fall into the *future old growth* category within the watershed area, of which 464 acres meet the minimum age requirement based upon GIS stands data (See Figure 9). A total of 35 additional acres meet the minimum age requirement for the Xeric Pine and Pine Oak community type within the suitable land base. Based upon the data shown in the table, almost half (47%) of the forested acres in the watershed area fall within the *future old growth* category based upon land management prescriptions, and of the community types present, all are also very well represented in the *future old growth* category.

Figure 9. Vegetation communities, unsuitable prescriptions, and riparian corridors in the Middle and Upper Tellico River Watershed Assessment Area, Cherokee National Forest, Monroe County, Tennessee, 2009.



No stands have been identified as meeting the existing old growth criteria during stand exams conducted in the watershed area. A field trip to look at *possible old growth* stands in the watershed area was held on March 28, 2008. Forest Service employees and members of the Southern Appalachian Forest Coalition and Wildlaw traversed several miles from Grassy Top (on the eastern crest of the watershed) down through the Sycamore Creek drainage. Previous inventory by members of the Southern Appalachian Forest Coalition had suggested that much of this area could be old growth forest. While many stands showed signs of developing old growth characteristics (multi-layered canopies, large woody debris, etc.) most areas showed some signs of previous management and did not meet the minimum age requirements of the forest type. A few trees on steep slopes and ridges were aged using an increment borer and while some resulted in ages above the minimum age for a particular old growth community type, no stands were

delineated as *existing old growth* during the field trip. It is likely that portions of some of these areas would qualify as *existing old growth* however these areas are remote and not in areas of any proposed management.

As individuals projects are proposed and analyzed through NEPA procedures, any stands meeting the 4 criteria for existing old growth will be mapped. The contribution of identified patches will then be considered with regard to the distribution and abundance of the old growth community type and to the desired condition of the appropriate management prescription during project analysis. This could include recommendations to change land-class codes on individual stands to reflect the intent to manage the area for old growth characteristics (See pages 27-29 of the *Regional Guidance Document*). This analysis is consistent with Forest Wide Standard FW-46. The network of riparian areas and other unsuitable prescriptions should provide a good mix of small, medium, and large old growth patches as outlined in the RLRMP and *Regional Guidance Document*, however, this watershed level analysis presented in the context of the forest-wide old growth network should also serve to clarify the importance of certain patches in the network, or where there may be a need to change the land-class of these *future old growth* patches, particularly in old growth types that have smaller representation across the forest than others.

Desired Future Condition

Successional Forested Habitats

The RLRMP EIS provides objectives for forest successional habitats based on the successional mixes needed to cover the range of preferences documented for forest-associated species (USDA 2004b). This successional mix consists of 3-6% early successional forest, 69% mid- and late-successional forest combined, and 54% late-successional forest. To be most meaningful for providing desired habitat conditions for wildlife, percentage objectives apply to blocks of over 1,000 acres of contiguous prescriptions with the same successional objectives. Prescription allocation blocks of less than 1,000 contiguous acres may be lumped with nearby prescriptions having the same successional forest objectives. Grouping of prescription blocks for analysis purposes should be stable over time to provide a consistent basis for project planning (USDA 2004a).

Because successional forest objectives describe a desired ecological condition, percentage objectives apply to all forested land, not just acreage classed as suitable for timber production. Non-forest, which includes roads, water, and permanent openings, such as pastures, permanent wildlife openings, old fields, maintained rights-of-way, and balds, are not included in calculations of early-successional forest percentages. Woodlands, savannas, and grasslands, which will be managed for a relatively open condition on a permanent basis, also are not included in these calculations. For both logistical and ecological reasons, patches smaller than 2 acres will not be tracked separately, but will be combined with the surrounding successional type. Successional forest conditions on surrounding private lands are not included in calculations, but should be considered when developing alternatives during project-level planning (USDA 2004a).

The desired future condition for successional forested habitats in the Middle and Upper Tellico River Watershed Assessment Area includes 870 to 1,740 acres (3-6%) of early successional forest, 19,995 acres (69%) of mid- and late-successional forest combined, and 15,648 acres

(54%) of late-successional forest. In comparison to current successional forest levels, early successional forest needs to be increased by 225 to 1095 acres, mid- and late-successional forest combined exceeds goals by 3,714 acres, and late-successional forest exceeds goals by 1,887 acres.

High Elevation Early Successional Habitats

Under the current RLRMP prescriptions allocated to high elevation areas it is expected that a range of 2,273-5,683 acres of high quality early successional habitat could be maintained in high elevation across the CNF. Optimal habitat conditions for species closely associated with these habitat types include regeneration areas and abandoned fields characterized by clumps of shrubs and saplings, scattered trees and grassy or herbaceous ground cover typically containing blackberry, or *Rubus* spp. with woody plants between one and ten meters in height. Optimal patch size for many associated species is 20-100 acres. In the absence of large-scale natural disturbances, timber harvesting will effectively create early-successional habitat. Once open habitats are established, optimum management techniques include prescribed burning or intermittent mowing (USDA 2004b).

Much of the current 152 acres of high elevation early successional habitat in this watershed will age beyond ten years in the next 5-6 years. This area is one of the few that could be managed to provide this habitat type the RLRMP indicates is needed.

Permanent Openings and Old Fields, Rights of Way, Improved Pastures

These habitat types should be promoted in appropriate locations and maintained where they currently exist. Many permanent openings and rights-of-way should be managed to promote native grasses and forbs.

Old Growth

The desired future condition is to have a network of small, medium, and large patches of old growth appropriately distributed across the landscape representing the major forest types that occur in the area. Stands chosen for management as old growth would not be affected by other forest uses. Stand replacement events such as fire and storm damage would potentially result in local adverse effects on old growth. Forest health problems such as hemlock woolly adelgid and gypsy moth could result in large scale adverse effects on specific old growth community types. The high percentage of the area aged 60 to 90 years would generally serve well as a connective matrix for old growth patches. Site-specific evaluation would determine specific needs for connective corridors. RLRMP objectives and standards for eastern hemlock, mixed mesophytic, and northern hardwoods place limitations on management that would potentially contribute to the amount of future old growth. The contribution of other management direction to the establishment of old growth would potentially also be considerable.

Opportunities

Successional Forested Habitats

The Middle and Upper Tellico River Watershed Assessment Area includes 10 different RLRMP Management Prescriptions. Of these Prescriptions, three are considered suitable for timber management; Prescription 7.B, 8.B, and 9.H. Prescription 7.B (Scenic Corridors/Sensitive

Viewsheds) encompasses 7,116 acres in the assessment area. This prescription has no specific objective for creating early-successional forest habitats and because primary emphasis is on scenic quality, opportunities to create substantial areas (>20 acres) of early successional habitat are limited by visual concerns. Primary emphasis is on creating smaller openings for wildlife viewing. Some limited opportunities may exist to create early successional habitat in this prescription area (USDA 2004a).

Prescription 8.B (Early Successional Habitat Emphasis) encompasses 6,754 acres in the assessment area. This prescription emphasizes providing optimal to suitable habitat for a variety of upland game species and plants and animals associated with early successional forest habitats. Goals are to "Manage forest successional stages to maintain a minimum of 20 percent of forested acres in mid- late-successional forest, including old growth; a minimum of 10 percent of forested acres in late-successional forest, including old growth; and 10 to 17 percent in early-successional forest" (USDA 2004a).

Prescription 9.H (Management, Maintenance, and Restoration of Plant Associations to their Ecological Potential) encompasses 260 acres in the assessment area. This Prescription is aimed at managing and restoring landscape vegetative community patterns to their ecological potential while providing suitable to optimal habitats to support populations of the plant and animal species associated with these communities. Goals are to "Manage forest successional stages to maintain a minimum of 50 percent of forested acres in mid- late-successional forest, including old growth; a minimum of 20 percent of forested acres in late-successional forest, including old growth; and 4 to 10 percent in early-successional forest" (USDA 2004a).

High Elevation Early Successional Habitats

RLRMP Objective 12.01 states "maintain at least 1,000 acres above 3,000 feet elevation in habitats characterized by grassy/herbaceous ground cover [on the CNF]. This acreage may be comprised of open woodlands, savannas, and grasslands; old fields; and regenerating forests (0-10 years old)".

In the Middle and Upper Tellico River Watershed Assessment Area 5 different RLRMP Management Prescriptions encompass acreage above 3,000 feet. Of these Prescriptions, two are considered suitable for timber management; Prescription 7.B and 9.H. Prescription 7.B (Scenic Corridors/Sensitive Viewsheds) encompasses approximately 12,158 acres above 3,000 feet in the assessment area. This prescription has no specific objective for creating early-successional forest habitats and because primary emphasis is on scenic quality, opportunities to create substantial areas (>20 acres) of early successional habitat are limited by visual concerns. Primary emphasis is on creating smaller openings for wildlife viewing. Some limited opportunities may exist to create high elevation early successional habitat in this prescription area.

Prescription 9.H (Management, Maintenance, and Restoration of Plant Associations to their Ecological Potential) encompasses approximately 62 acres above 3,000 feet in the assessment area. This Prescription is aimed at managing and restoring landscape vegetative community patterns to their ecological potential while providing suitable to optimal habitats to support populations of the plant and animal species associated with these communities. Goals are to "Manage forest successional stages to maintain a minimum of 50 percent of forested acres in mid- late-successional forest, including old growth; a minimum of 20 percent of forested acres in

late-successional forest, including old growth; and 4 to 10 percent in early-successional forest" (USDA 2004a).

The remainder of the area above 3,000 feet is in Prescription 12.B Remote Backcountry Recreation Nonmotorized. While this prescription is not suitable for timber management, vegetation management may be done for other considerations including locally rare habitat improvements.

The National Forests in North Carolina in Graham County is currently proposing a research project in conjunction with the University of Tennessee and the North Carolina State University. The study involves a series of shelterwood timber cuts at high elevation to monitor the effects to a number of species, many of which are rare and in decline and the same species the RLRMP discusses as in need of management. The opportunity exists to partner with these groups to expand the sample size of the research project into the Upper Tellico watershed. Additional shelterwood cuts are needed for the current research proposal.

By harvesting timber in these high elevation areas, it would accomplish two goals: provide needed habitat and also provide research opportunities.

Permanent Openings and Old Fields, Rights of Way, Improved Pastures

RLRMP objective 17.09 states "Convert fescue fields (140 acres) to native grasses within a 10-year period where practical."

Recommendations/Priorities

Successional Forested Habitats

Prescription 7.B emphasizes scenic quality. Consequently, visual concerns restrict opportunities to create substantial areas (>20 acres) of early-successional forest habitat. However, some limited opportunities may exist to create early successional habitat in this prescription area and this should be evaluated during development of project level activities.

Currently, in Prescription 8.B there is approximately 255 acres in the 0-10 early successional age class in the Assessment Area. An additional 420 to 1,148 acres of early successional habitat could be created in this Prescription area. Mid- and late-successional forest combined and late-successional forest exceeds goals and could be reduced.

Currently, in Prescription 9.H, no early successional forest occurs in the Assessment Area. An additional 10 to 26 acres of early successional habitat could be created in this Prescription area. Mid- and late-successional forest combined and late-successional forest exceeds goals and could be reduced.

High Elevation Early Successional Habitats

Prescription 7.B emphasizes scenic quality. Consequently, visual concerns restrict opportunities to create substantial areas (>20 acres) of early-successional forest habitat. However, some limited opportunities may exist to create smaller openings. There are opportunities to create early successional habitat in Prescriptions 8.B and 9.H. All of these opportunities should be evaluated for implementation during development of project level activities.

With the limited high elevation early successional habitat currently available to support at risk species coupled with the opportunity to partner with the National Forests in North Carolina and 2 universities, this area is highly recommended for creating this habitat.

Permanent Openings and Old Fields, Rights of Way, Improved Pastures

There are currently 26 acres of spot openings and approximately 12 miles of high-voltage transmission line traversing the assessment area that should be evaluated for conversion to native vegetation.

Old Growth

A large percentage of the assessment area falls into the category of "Future Old Growth". Consider designation of key future old growth sites during a NEPA process.

Terrestrial Habitat Attributes

Existing Condition

Riparian Habitats

Terrestrial riparian habitats are abundant within the Middle and Upper Tellico watersheds, primarily along the Tellico River and its many tributaries. Terrestrial riparian habitats encompass the transition area between aquatic systems and upland terrestrial systems. All wetlands (including beaver ponds), as well as margins of varying widths along streams, rivers, lakes, ponds, and reservoirs, are contained within terrestrial riparian habitats. These areas provide a number of critical functions for associated species. Most importantly, they provide rich, moist environments, not often found in upland areas. Riparian terrestrial habitats may serve as corridors for wildlife movement, allowing for daily travel and seasonal migration. The riparian area may serve as a connector of habitats and populations allowing gene flow to occur, thus keeping populations genetically vigorous (USDA 2004a). Riparian habitats ideally include a mosaic of native plant and animal communities and successional stages, with a predominance of late-successional forests. Late successional riparian forests contain multiple canopy layers that provide a variety of ecological niches, thermal and protective cover, and maintenance of moist conditions. Decadence of older forests provide an abundance of snags and downed wood, which also help retain moisture and provide important habitat substrate for reptiles, amphibians, small mammals, invertebrates, and mosses and liverworts. The majority of riparian dependent species need or prefer late-successional forest conditions for the diverse structure and the moist, temperature-moderated microclimates they provide.

Snags, Dens, and Downed Wood

Snags, dens, and downed wood (including branches, large logs, stumps, and root wads) are important habitat components, structurally and as sources of energy, for terrestrial and aquatic communities. Many species of potential viability concern are associated with snags, downed wood, or den trees. Large snags provide birds with nesting and feeding sites, singing perches, and as lookout posts for predators and prey. Bats roost and produce maternity colonies under exfoliating bark. Viability of the Indiana bat (*Myotis sodalis*) is critically tied to snags because of their use as roosts. The need to avoid disturbance to this species is the driving factor in considering effects of management on snags. Amphibians, reptiles, small mammals, and

invertebrates utilize snags and downed woody debris as cover. A variety of species utilize snags, logs, and stumps as den sites. Downed wood and logs are used as drumming sites by grouse to attract mates. Small mammals utilize logs as travel ways. Fungi and other decomposers of woody debris are key components of food webs. Rotting wood tends to absorb moisture during wet periods and release it in dry periods thus helping to maintain a cooler microclimate (USDA 2004b).

Den trees, defined as living trees with hollows or cavities inhabited by animals, are a critical habitat component for many species. They are used for nesting, roosting and hibernating. Little information is available on how much large woody material is sufficient to support associated species. A general recommendation of 2-4 snags per acre is considered a "reasonable target." Generally, for most dependent wildlife, the more snags available the greater the benefit (USDA 2004b).

Within the aquatic system, downed wood from riparian trees and shrubs greatly influence stream channel morphology and aquatic ecology. By obstructing stream flow, large woody debris stores and distributes sediment, and creates channel features, such as pools, riffles, and waterfalls. Wood also traps organic matter, which allows this material to be processed by instream organisms. Fish and insects occupy the pools and riffles created by the large woody debris, and riparian forest regeneration occurs on deposited sediment. Turtles and snakes use logs in streams and overhanging branches for basking and sunning. Large woody debris in riparian areas is used as cover by amphibians, insects, and other invertebrates, and small mammals (USDA 2004b).

Snag, downed wood, and den site availability is influenced by a variety of factors including tree species, age, forest health, slope, aspect, and fire intensity and frequency. Fire may reduce snags and downed wood in fire-dependent communities, but can also cause some tree mortality creating new snags and downed wood. Snags and downed wood also may be extremely abundant in forests affected by mortality events such as storms, insect, and disease outbreaks. Snags, downed wood, and den trees are typically most abundant in late-successional forests (USDA 2004b).

Snag availability is currently not considered a limiting factor on the CNF. Current abundance of late-successional forest by community type is discussed in detail in the section on Successional Forest Habitats. This information indicates late-successional forests are abundant in the assessment area. It is estimated that there are about 7 to 8 snags per acre across the CNF and the recent SPB outbreak has resulted in a sharp increase in snag availability over the past several years (USDA 2004b).

Desired Future Condition

Riparian Habitats

The management goal for riparian corridors is to maintain or enhance the structural and functional integrity of riparian areas and associated aquatic and upland systems. Riparian corridor characteristics important to structural and functional integrity for terrestrial wildlife include habitat connectivity; vegetation diversity (including age, species composition, and vegetation layer diversity), vegetation vigor, abundance of snags and woody debris, and a width that is adequate to retain riparian habitat functions. Riparian corridors include the concept of buffering streams to retain important stream functions, but they also encompass the functional aspects of riparian areas relative to uplands. Therefore, they present the opportunity to manage

riparian habitat as a more completely functioning system in which streams and uplands mutually influence each other.

Snags, Dens, and Downed Wood

Unless another disease outbreak occurs, a gradual decline toward pre-SPB outbreak levels should be expected over the next several years as these trees decay and fall to the ground. However, there is an abundance of mature forest throughout the project area and as the average age of the forest continues to increase, snag availability is expected to exhibit a gradually increasing long-term trend (USDA 2004b). Consequently, future snag availability is not considered to be a limiting factor on the CNF.

Opportunities

Riparian Habitats

A 100-foot riparian buffer will provide habitat for many terrestrial wildlife species. The forested landscape-scale setting of the national forest will provide the wider riparian areas required by forest interior bird species in most locations.

Snags, Dens, and Downed Wood

Activities to increase availability of snags, dens, and downed wood on the CNF will not be required.

Recommendations/Priorities

Riparian Habitats

To provide for riparian integrity, management standards are included in the Riparian Prescription. These include provisions to provide desirable levels of woody debris, and controls on impacts from grazing, recreational uses, mineral development, and fireline construction. Vegetation management is limited to that needed to maintain or improve riparian function. Zones around channeled ephemeral streams are also recognized as special areas, with standards designed to ensure protection of channels and their function as part of the riparian network.

Snags, Dens, and Downed Wood

Forestwide direction states that unless necessary for small scale projects involving insect or disease control or facility development, or to provide for public and employee safety, standing snags and den trees would not be cut or bulldozed during vegetation management treatments unrelated to timber salvage. For timber salvage treatments, all live den trees, and a minimum average of six snags per acre from the largest size classes would be retained and may be clumped. In stand regeneration treatments greater than ten acres in size, a minimum average basal area of 15 square feet per acre is retained throughout the rotation. Although this basal area pertains to live trees, priority is given to retaining the largest available trees that exhibit characteristics provided by snags and those favored by roosting Indiana bats (sloughing bark, cracks and crevices). For potential black bear den trees, Forestwide direction states that den trees would be left during all vegetation management treatments occurring in habitats suitable for bears. Potential den trees are greater than 20 inches DBH and are hollow with a broken top. Direction within Prescription 8.E.1, states that at least one downed tree greater than 12 inch dbh

would be left per acre during management activities, to be a potential ruffed grouse drumming log. With these provisions included under all alternatives, existing snags, downed wood, and den trees would be well maintained on NFS land (USDA 2004a and 2004b).

Aquatic Habitats

Existing Condition

All streams in the MUTR drain to lower the Tellico Reservoir on the Little Tennessee River. This area is within the Blue Ridge Province. Based on the Final Environmental Impact Statement for the RLRMP (USDA 2004b) the Little Tennessee River Watershed is in the best condition of all 24 watersheds. Sediment, temperature, and altered stream flow all rated excellent while point source pollution has an acceptable rating of average. None of the other water quality factors pose a risk to aquatic species viability (USDA 2004b).

The MUTR assessment area contains approximately 620 miles of ephemeral, intermittent and perennial streams with 57 miles providing recreational fishing opportunities (Table 8).

Table 8. Forest Service managed aquatic habitats in the MUTR

Aquatic Habitats	Miles in Assessment area
Ephemeral Streams	385 miles
Intermittent Streams	128 miles
Perennial Streams	107 miles
Fishery Waters	
Coldwater	41 miles
Coolwater	16 miles

Approximately 57 miles of Forest Service managed streams are capable of supporting fish and are displayed in Table 9 along with their physical characteristics. Twenty-four of fifty reaches have been surveyed for fish. Based on their physical characteristics, none of the unsurveyed streams are likely to support any different or rare species.

Table 9. Middle and Upper Tellico River Streams Capable of Supporting Fish

Stream Name	Reach	Low Elev	Up Elev	Miles	% Gradient	Order
GOLD COVE BRANCH	1	2800	3200	0.5	16.00	3
KIRKLAND COVE	1	2180	2560	0.5	13.60	3
SYCAMORE CREEK-UNNAMED TRIB #1	1	3640	4000	0.4	17.10	3
SYCAMORE CREEK-UNNAMED TRIB #2	1	3820	4120	0.3	20.00	3
SYCAMORE CREEK	1	2100	2700	1.79	6.40	4
SYCAMORE CREEK	2	2700	3060	0.62	10.90	4
SYCAMORE CREEK	3	3060	3620	0.87	12.20	4
SYCAMORE CREEK	4	3640	4200	0.7	16.00	4
BIG OAK COVE CREEK	1	2540	3200	0.9	13.80	3
BIRCH BRANCH	1	2230	2600	0.5	13.20	3
DAVIS CREEK	1	2200	2900	0.9	14.60	3

Table 9. Middle and Upper Tellico River Streams Capable of Supporting Fish

Stream Name	Reach	Low Elev	Up Elev	Miles	% Gradient	Order
HOLDER COVE BRANCH	1	2520	3040	0.6	17.30	3
ROUGH RIDGE CREEK-UNNAMED TRIB	1	2960	3200	0.4	12.00	3
ROUGH RIDGE CREEK	1	2580	2800	0.9	4.60	4
ROUGH RIDGE CREEK	2	2800	3140	0.9	7.60	4
ROUGH RIDGE CREEK	3	3140	3700	0.8	13.30	3
TELLICO RIVER-UNNAMED TRIB	1	2400	2820	0.4	21.00	3
BIG BRANCH	1	1500	1680	1.5	2.30	4
HOBBS HOLE BRANCH	1	1700	1820	0.5	4.10	3
TURKEY CREEK-UNNAMED TRIB #1	1	1740	2000	0.8	6.50	3
TURKEY CREEK-UNNAMED TRIB #2	1	1740	2000	0.9	5.40	3
TURKEY CREEK	1	1200	1500	2.4	2.40	5
TURKEY CREEK	2	1540	1660	1.4	1.60	5
TURKEY CREEK	3	1740	1780	0.3	2.50	3
BASIN CREEK	1	1040	1660	2.06	5.70	4
BIG BRANCH	1	900	1000	0.8	2.50	4
BUCK BRANCH	1	1080	1320	0.8	6.00	3
BUCKHORN CREEK	1	1520	1680	0.3	10.70	3
CANEY BRANCH	1	1040	1520	1.7	5.20	4
GREEN COVE BRANCH	1	1860	1900	1.01	0.70	4
JOHNS CREEK	1	1080	1200	0.3	8.00	4
JOHNS CREEK	2	1450	1680	0.9	5.10	3
LAUREL CREEK	1	1160	1480	1.1	5.30	4
MILLER MINE BRANCH	1	1120	1600	0.6	16.00	3
OOSTERNECK CREEK	1	1080	1120	0.8	0.90	5
OOSTERNECK CREEK	2	1200	1280	0.5	3.20	5
OOSTERNECK CREEK	3	1400	1320	0.5	2.80	3
PANTHER BRANCH	1	1720	2040	1.6	3.80	4
PHEASANT BRANCH	1	2040	2240	0.5	7.10	4
SPIVEY CREEK	1	1880	1920	0.5	1.40	4
TELLICO RIVER	1	870	1200	7.1	0.90	7
TELLICO RIVER	2	1200	1380	1.8	1.90	7
TELLICO RIVER	3	1380	1620	3.5	1.30	6
TELLICO RIVER	4	1620	1860	2.93	1.60	6
TELLICO RIVER	5	1900	2100	1.6	2.40	6
TELLICO RIVER	6	2100	2580	3	3.00	6
THRASHING BRANCH	1	1000	1080	0.3	5.00	3
FALL BRANCH	1	1380	1500	1	2.20	3
QUARRY CREEK	1	1130	1330	0.92	4.10	4
SMOKY RUN	1	960	1080	0.9	2.60	4

A total of 53 species of fish have been documented from the streams in this area (Table 10). Two are Endangered; two are Threatened; two are Sensitive; three are Locally Rare; nine are game species (including two desirable exotics); and two are introduced undesirable exotic

species. The remaining fish species are all natives. One Locally Rare salamander occurs in the area: hellbender. Other aquatic species present in this area, include: amphibians, reptiles, insects, crayfish, and snails. No known game or rare species from these taxa occur here.

Table 10. The total number of fish populations in the MUTR and their relative abundance across this Forest (USDA 2004c)

Species	Populations		Status
	MUTR	Forest	
duskytail darter	1	2	Endangered
smoky madtom	1	2	Endangered
spotfin chub	1	1	Threatened
yellowfin madtom	1	2	Threatened
Tennessee dace	2	36	Sensitive
wounded darter	1	3	Sensitive
mountain madtom	1	1	Locally Rare
silver shiner	1	3	Locally Rare
stargazing minnow	1	3	Locally Rare
bluegill	3	58	Game
brook trout	9	153	Game
brown trout	4	98	Game Introduced/Desirable
green sunfish	1	34	Game
largemouth bass	1	24	Game
rainbow trout	16	272	Game Introduced/Desirable
rock bass	5	77	Game
smallmouth bass	2	56	Game
spotted bass	1	21	Game
carp	1	5	Introduced/Undesirable
yellow perch	1	11	Introduced/Undesirable
banded darter	2	17	Native, On
banded sculpin	1	85	Native, On
bigeye chub	1	22	Native, On
black redhorse	1	28	Native, On
central stoneroller	10	132	Native, On
channel catfish	1	7	Native, On
creek chub	15	228	Native, On
fantail darter	3	33	Native, On
freshwater drum	1	6	Native, On
gilt darter	2	9	Native, On
golden redhorse	1	12	Native, On
greenside darter	3	39	Native, On
lamprey sp.	1		Native, On
logperch	2	15	Native, On
longnose dace	2	106	Native, On
mirror shiner	1	16	Native, On
northern hogsucker	8	111	Native, On
northern studfish	1	8	Native, On

Table 10. The total number of fish populations in the MUTR and their relative abundance across this Forest (USDA 2004c)

Species	Populations		Status
	MUTR	Forest	
redline darter	2	48	Native, On
river chub	6	71	Native, On
river redhorse	1	7	Native, On
rosyside dace	7	16	Native, On
saffron shiner	4	26	Native, On
speckled darter	1	5	Native, On
striped shiner	1	36	Native, On
tangerine darter	2	11	Native, On
telescope shiner	3	31	Native, On
Tennessee darter	2	59	Native, On
Tennessee shiner	3	58	Native, On
warpaint shiner	7	82	Native, On
western blacknose dace	13	293	Native, On
whitetail shiner	3	39	Native, On
yellow bullhead	1	14	Native, On

There are 54 (Table 11) aquatic or semi-aquatic TES species on the CNF TES species list (Cherokee National Forest 2001); 13 (Table 11 and 12) of these could occur in the assessment area.

Table 11. Aquatic and semi-aquatic Threatened, Endangered and Sensitive species on the CNF list and potentially in the MUTR

Group	Number	
	CNF List	Assessment area
Amphibians	6	0
Fish	18	6
Insects	8	7
Mussels	21	0
Reptiles	1	0
Totals	54	13

Table 12. Aquatic and semi-aquatic Threatened, Endangered and Sensitive species that may occur within the MUTR

Group	Common Name	Status	Assessment Area	Forest Wide
Fish	duskytail darter	Endangered	Present	Tellico River
Fish	smoky madtom	Endangered	Present	Tellico River
Fish	spotfin chub	Threatened	Present	Tellico River
Fish	yellowfin madtom	Threatened	Present	Tellico River
Fish	Tennessee dace	Sensitive	Present	Oosterneck Creek and Smoky Run
Fish	wounded darter	Sensitive	Present	Tellico River

Table 12. Aquatic and semi-aquatic Threatened, Endangered and Sensitive species that may occur within the MUTR

Group	Common Name	Status	Assessment Area	Forest Wide
Insects	Helma's net-spinning caddisfly	Sensitive	Not Documented	Polk County
Insects	Cherokee clubtail	Sensitive	Not Documented	Polk County
Insects	Green-faced clubtail	Sensitive	Not Documented	Unknown
Insects	Mountain river cruiser	Sensitive	Not Documented	Unknown
Insects	Allegheny snaketail	Sensitive	Not Documented	Unknown
Insects	Edmund's snaketail	Sensitive	Not Documented	Polk County
Insects	Appalachian snaketail	Sensitive	Not Documented	Polk County

Desired Future Condition

All aquatic ecosystems function properly and support viable populations of all expected aquatic species given their physical limitations.

Movement of aquatic organisms is not impeded by culvert barriers.

Opportunities

Anthropogenic sediment sources are identified and stabilized:

Continue to discuss opportunities to reduce sediment generated from North Carolina in the Upper Tellico OHV Area.

Locate sediment sources in Laurel Creek watershed and stabilize them.

Improve road grading to reduce sediment pushed into streams and to redirect ditch flow away from streams.

Provide a transportation system that protects forest resources

During road reconstruction, provide for aquatic organism passage at every culvert.

Reintroduce and establish viable populations of aquatic species where they have been eliminated.

Brook trout - evaluate tributaries to Tellico River near state line and tributaries to Sycamore Creek for possible re-introduction sites

Continue to reintroduce and monitor the four T&E fish species in the lower Tellico River

Improve angler access to small streams by trimming back rhododendron.

Rough Ridge

Turkey Creek

Recommendations/Priorities

All of the opportunities listed above are recommended for implementation.

Threatened & Endangered Species

Existing Condition

Currently, there are 2 threatened and 2 endangered species known from the Upper and Middle Tellico River Watershed Assessment Area (Table 13). These data are from the Tennessee Department of Environment and Conservation Natural Heritage Database (2008) and represent the best source of known data for the project area. All of these fish in Tellico River are experimental populations.

Table 13. Threatened and endangered species known from the Middle and Upper Tellico River Watershed Assessment Area, Cherokee National Forest, Monroe County, Tennessee, 2009.

Scientific Name	Common Name	Status
Fish		
Cyprinella monacha	Spotfin chub	Threatened
Noturus flavipinnis	Yellowfin madtom	Threatened
Etheostoma percnurum	Duskytail darter	Endangered
Noturus baileyi	Smoky madtom	Endangered

Desired Future Condition

The CNF RLRMP includes broad goals and objectives to contribute to the conservation of threatened and endangered species. Forestwide standards are also included that are designed to protect individuals and locations of threatened and endangered species within the planning area (USDA 2004a).

Opportunities

Any proposed projects within the vicinity of known populations of threatened and endangered species, will be evaluated for potential effects and appropriate mitigation measures would be developed to ensure no detrimental effects occur.

Recommendations/Priorities

It is hoped that through achieving these goals and objectives and adherence to these standards that the forest of the future will support healthy watersheds that include a wide diversity of species including those threatened and endangered species unique to the southern Appalachian ecosystem.

Demand Species

Existing Condition

The public utilizes a variety of plant and animal species, which occur on the CNF. These species are termed demand species and public activities include hunting, fishing, gathering plants and plant parts for food, herbal medicines, or as ornamentals. Important wildlife demand species within the Middle and Upper Tellico Watershed Assessment Area include white-tailed deer, eastern wild turkey, ruffed grouse, and black bear (USDA 2004b).

Abundance of wildlife demand species are directly influenced by the quality and quantity of key habitat features. Existing conditions of key habitat features including hard mast in oak and oak-

pine forests and successional forest habitats, are discussed in detail in the respective sections of this document. The black bear and eastern wild turkey are habitat generalists and tend to thrive in areas with abundant late successional forest habitat. Consequently, these species are relatively abundant in the assessment area and are not discussed further. White-tailed deer and ruffed grouse rely more heavily on mixed habitat types, most notably early-successional habitat. Early-successional habitat is lacking in the assessment area. Consequently, white-tailed deer and ruffed grouse numbers are relatively low in the assessment area. Achieving RLRMP objectives for major forest communities and early-successional habitats would greatly improve habitat conditions these species.

There are eight aquatic demand species that have been documented within the assessment area (Table 10). Very low angler interest exists for the cool water species and there is an abundance of fishing opportunities for them across the Forest. Some of the high elevation stream reaches (greater than 1200 feet in elevation) are supporting small populations of brown and rainbow trout.

Table 10. The total number of Demand (Game) fish populations in the MUTR and the number of populations across this Forest (USDA 2004c)

	Populations	
Species	**MUTR**	**Forest**
bluegill	3	60
green sunfish	1	37
redbreast sunfish	1	43
rock bass	6	80
smallmouth bass	3	57
spotted bass	2	23
brown trout	1	101
rainbow trout	3	312

Desired Future Condition

Due to the high public demand for white-tailed deer and ruffed grouse, increasing population levels is highly desirable. Achieving harvest levels that reflect areas of more moderate deer and grouse population levels is a practical goal for the assessment area.

Recreational fishing for cool and cold water species increases.

Opportunities

Refer to the RLRMP objectives for mesic deciduous forest; oak and oak-pine forest; woodlands, savannas, and grasslands; and successional habitats in the respective biological element sections in this document.

Electrofish the unsurveyed streams and determine where wild rainbow trout populations should be sustained. Promote both cold and cool water fishing to public.

Recommendations/Priorities

Achieving RLRMP objectives for mesic deciduous forest; oak and oak-pine forest; woodlands, savannas, and grasslands; and successional habitats would greatly improve habitat conditions for white-tailed deer and ruffed grouse.

Survey the stream reaches where trout populations exist or could be established.

Non-Native Invasive Plants and Animals

Existing Condition

A multitude of invasive, non-native plants threaten the integrity of native ecosystems in the southern Appalachian area. The Southern Appalachian Assessment (SAMAB 1996) provides a summary of the major threats from invasive plant species in our region.

On the CNF, the following non-native invasive plant species are tracked through project level inventories: Tree of heaven (*Ailanthus altissima*), small carpetgrass (*Arthraxon hispidus*), autumn olive (*Eleagnus umbellata*), English ivy (*Hedera helix*), sericea lespedeza (*Lespedeza cuneata*), privet (*Ligustrum sinense*), Japanese honeysuckle (*Lonicera japonica*), Nepal grass (*Microstegium vimineum*), princess tree (*Paulownia tomentosa*), kudzu (*Pueraria lobata*), and multiflora rose (*Rosa multiflora*). While other invasive plant species may occur with scattered distributions on the Forest, these species are recognized as having significant occurrences with a high potential for impacts to native communities on the Forest (USDA 2004a).

Within the MUTR, invasive plant species are abundant along many roads and trails and within spot wildlife openings. Kudzu is becoming and increasing problem within the Tellico River corridor and Nepal grass occurs along most roads, and is especially a problem along linear wildlife openings. This grass out-competes other desired vegetation and is often the most abundant vegetation type where it exists. Wildlife do not use Nepal grass, thus the plant is having an adverse effect on wildlife habitat in the assessment area. Autumn olive, originally planted to benefit wildlife, is now threatening to turn some wildlife openings into dense, impenetrable thickets.

In 1999 the Southern Region released a Noxious Weed Management Strategy that outlined five emphasis areas, 1) Prevention and Education, 2) Control, 3) Inventory, Mapping, and Monitoring, 4) Research, and 5) Administration and Planning. This was followed in 2001 with the development of the Regional Forester's Invasive Exotic Plant Species list. The RLRMP includes numerous goals, objectives, and standards to address the potential impacts of non-native invasive species. These include control efforts and maintenance and restoration of native species. The CNF is recently completed a forest-wide environmental assessment to implement control measures for non-native invasive plant species.

Although not mentioned in the Southern Appalachian Assessment, the wild boar (*Sus scrofa*) is another example of non-native species that is negatively affecting certain habitats in the southern Appalachians. Wild boars were introduced into the southern Appalachian Mountains in the early 1900's. Originally imported for hunting, they eventually escaped from their enclosed hunting reserves in North Carolina and over time have become a naturalized component of the area's fauna (USDA 2004a). Management of this species is somewhat controversial in that some hunters desire it as a major game species, yet its impacts to the natural environment must be mitigated. The integrity of unique communities and riparian areas found within the assessment area is threatened by damage from soil disturbance created by rooting of wild boars and feral hogs.

Desired Future Condition

In 1999 the Southern Region released a Noxious Weed Management Strategy that outlined five emphasis areas, 1) Prevention and Education, 2) Control, 3) Inventory, Mapping, and Monitoring, 4) Research, and 5) Administration and Planning. This was followed in 2001 with the development of the Regional Forester's Invasive Exotic Plant Species list.

The CNF RLRMP includes numerous goals, objectives, and standards to address the potential impacts of non-native invasive species. These include control efforts and maintenance and restoration of native species. Negative effects from non-native invasive species will be minimized through adherence to Regional policy and the implementation of RLRMP goals, objectives, and standards. Previous work illustrating the success of this type of management include the conversion of a large kudzu patch near the Conasauga

River to an open meadow supporting native grasses and wildflowers, fencing rare plant populations to exclude wild boars, and converting approximately 200 acres of fescue fields to native warm season grasses since 1997. While it is unlikely that non-native invasive species will ever be completely eliminated from the forest, it is hoped that through achieving these goals and objectives and adherence to these standards that the impacts from these species can be mitigated in the forests of the future.

Opportunities

Exotic species encroachment is becoming a serious problem in the assessment area, especially kudzu within the Tellico River corridor.

Recommendations/Priorities

Invasive exotic vegetation should be controlled by mechanical and chemical means using the best information available for each site and species.

Species Viability

Existing Condition

Currently, there are 33 species of viability concern known from the Upper and Middle Tellico River Watershed Assessment Area (Table 14). These data are from the Tennessee Department of Environment and Conservation Natural Heritage Database (2008) and represent the best source of known data for the project area.

Table 14. Species of viability concern known from the Middle and Upper Tellico River Watershed Assessment Area, Cherokee National Forest, Monroe County, Tennessee, 2009.

Scientific Name	Common Name	Status
Amphibians		
Cryptobranchus alleganiensis	Hellbender	Viability Concern
Desmognathus aenus	Seepage salamander	Viability Concern
Eurycea junaluska	Junaluska salamander	Sensitive
Hemidactylium scutatum	Four-toed Salamander	Viability Concern
Birds		
Corvus corax	Common raven	Viability Concern
Dendroica cerulea	Cerulean warbler	Viability Concern

Table 14. Species of viability concern known from the Middle and Upper Tellico River Watershed Assessment Area, Cherokee National Forest, Monroe County, Tennessee, 2009.

Sphyrapicus varius	Yellow-bellied spasucker	Viability Concern
Fish		
Phoxinus tennesseensis	Tennessee dace	Sensitive
Etheostoma vulneratum	Wounded darter	Sensitive
Insects		
Speyeria diana	Diana fritillary	Sensitive
Mammals		
Myotis leibii	Eastern small footed bat	Viability Concern
Napaeozapus insignis	Woodland jumping mouse	Viability Concern
Sorex cinereus	Common shrew	Viability Concern
Sorex fumeus	Smoky Shrew	Viability Concern
Sorex palustris	Water Shrew	Viability Concern
Reptiles		
Pituophis melanoleucus melanoleucus	Pituophis melanoleucus melanoleucus	Pituophis melanoleucus melanoleucus
Terrestrial Mollusks		
Glyphyalinia pentadelphia	Pink glyph	Viability Concern
Helicodiscus fimbriatus	Fringed coil	Viability Concern
Mesodon christyi	Glossy covert snail	Sensitive
Stenotrema fraternum montanum	A pillsnail	Viability Concern
Vertigo clappi	Cupped vertigo	Viability Concern
Mesomphix	Wrinkled button	Viability Concern
Plants		
Botrychium jenmanii	Alabama grape fern	Sensitive
Calamagrostis porteri	Porter's Reedgrass	Viability Concern
Carex manhartii	Manhart's Sedge	Viability Concern
Clintonia borealis	Clinton's Lily	Viability Concern
Hypericum mitchellianum	Blue Ridge St. John's-wort	Sensitive
Juglans cinerea	Butternut	Sensitive
Juncus gymnocarpus	Naked-fruited Rush	Viability Concern
Lobelia amoena	Southern Lobelia	Viability Concern
Megaceros aenigmaticus	Megaceros	Sensitive
Monotropsis odorata	Sweet Pinesap	Sensitive
Trichomanes petersii	Dwarf Filmy-fern	Viability Concern

Desired Future Condition

The CNF RLRMP includes broad goals and objectives to contribute to the conservation of rare species. Forestwide standards are also included that are designed to protect individuals and locations of species of viability concern within the planning area (USDA 2004a).

Opportunities

Any proposed projects within the vicinity of known populations of species of viability concern, will be evaluated for potential effects and appropriate mitigation measures would be developed to ensure no detrimental effects occur.

Recommendations/Priorities

It is hoped that through achieving these goals and objectives and adherence to these standards that the forest of the future will support healthy watersheds that include a wide diversity of species including those rare species unique to the southern Appalachian ecosystem.

Forest Health

Existing Condition

Forest health concerns for the CNF include insects, diseases, and age class distribution. Damage to forest communities occurs in varying degrees depending on community types and species composition, location on the landscape, age of the forested community, past disturbance, and weather conditions.

The suitable management prescriptions include 7B, 8B and 9H which total approximately 17,227 acres. Much of this suitable land is in the Middle Tellico River watershed. Some opportunities exist for vegetation management on other lands as well.

Age Class Distribution

Approximately 78 percent of the forested acres in the watershed are over 70 years old and approximately 4.2 percent of the forested acres are 0 to 10 years of age. The age class distribution for the watershed is imbalanced, skewed toward the older age classes. Stands of older trees are more vulnerable to periodic disturbances, such as pathogens (diseases), insects or a combination of factors.

Gypsy Moth

Gypsy moth (*Lymantria dispar*) is a major defoliator of hardwood trees in both forested and urban landscapes. It was introduced from Europe into Massachusetts sometime between 1867 and 1869. Because the favored host, oak, is widespread in the eastern deciduous forests, gypsy moth thrives and continues to escape its range west and south each year. By the 1980's, gypsy moth was established throughout the northeast. Today the area considered generally infested includes parts of Virginia, just north of the CNF. Gypsy moth is projected to occur on the forest between the year 2010 and 2025 (SAMAB 1996). The CNF can anticipate gypsy moth attacks on the north end of the forest as early as the year 2010 and for the south end of the forest as early as 2020.

Gypsy moth larvae feed on more than 300 species of trees, shrubs, and vines. Favored hosts include oak, apple, birch, basswood, witch hazel, and willow. Hosts moderately favored include maple, hickory, beech, black cherry, elm, and sassafras. Least favored hosts are ash, yellow poplar, American sycamore, hemlock, pine, spruce, black gum, and black locust. Feeding on less favored host plants usually occurs when high-density larval populations defoliate the favored tree species and move to adjacent, less favored species of trees to finish their development.

Approximately 41 percent of the forested acres (11,982 acres) are occupied by oak and oak dominated mixed stands that are over the age of 70. These older stands of oak are vulnerable to oak decline and other pest problems. Oak is highly vulnerable to gypsy moth infestation and older oak is less capable of surviving an outbreak.

Oak Decline

Oak decline is a complex problem characterized by progressive crown dieback and eventual mortality. It is best explained as the interaction of long term predisposing stress factors (drought, tree age, or droughty site factors), short term inciting factors (spring frost, or insect defoliation), and long term contributing factors of biotic origin (root disease, bark beetles, and canker or decay fungi). The most susceptible are older, slow growing oaks on low quality ridge top sites. Red oaks are more susceptible than white oak (USDA 1989). Oak decline is most likely to affect the same stands that are vulnerable to gypsy moth.

Hemlock Woolly Adelgid

Hemlock woolly adelgid (*Adelges tsugae*) (HWA) was introduced into the eastern U.S. from Asia in the early 1950's near Richmond, Virginia. The HWA was present on some exotic tree species that a private collector planted in his arboretum. The distribution of the HWA remained localized until the 1960's. The population has since spread throughout the Shenandoah Valley into the Blue Ridge Mountains of Virginia, North Carolina, South Carolina, Tennessee, Georgia and the northeastern U.S. Impacts to the host species *Tsuga canadensis* and *T. caroliniana*, eastern and Carolina hemlocks, respectively, are severe. The entire range of eastern hemlock is threatened and could be infested within 30 years. Infestation by the HWA has been detected on the north end of the CNF. There are also well-established populations in North Carolina and the Great Smoky Mountains National Park adjacent to much of the CNF. Recently, the adelgid has been found on the Tellico Ranger District. The CNF can expect to see much of its hemlock infested in the near future.

Once infested, tree mortality usually occurs in less than seven years. Mortality is not restricted to any size or age of hemlock. This insect pest threatens the hemlock resource and also threatens the unique ecosystem it helps comprise. Hemlock provides habitat for a variety of plants and animals and helps to maintain stream temperatures for a variety of aquatic species.

The watershed contains approximately 2,346 acres with hemlock as a primary component of the stands. The CNF HWA Suppression EA and DN (USDA 2005) include five hemlock treatment areas within this watershed assessment area. The treatment areas are located at Hobbs Hole, Miller Mine Branch, Tellico River, Sycamore Creek, and Haw Knob.

Southern Pine Beetle

The Southern Pine Beetle (SPB) (*Dendroctonus frontalis* Zimmermann) is the most destructive pine bark beetle in Tennessee and the southern U.S. (USDA 2004a). Pine trees are killed singly, in small groups, or in large numbers, sometimes exceeding hundreds of acres. The SPB is a native pest to the South and occurs in small numbers (endemic) until outbreak or epidemic population levels develop. Infestations can develop into outbreak levels when pine forests are stressed by crowded growing conditions, trees are damaged from ice or wind, during drought conditions, or when stands are considered biologically mature. These stress conditions can often prevent the tree from producing adequate resin flow to "pitch out" the attacking insect, which is

the tree's main defense in a SPB attack. Once pine stands are weakened, they become more susceptible to attack by SPB. Once populations develop in weakened trees, the beetles may spread to healthy trees that normally would resist attack. When beetle populations become large (epidemic), they can successfully attack healthy, vigorous trees and result in widespread mortality. Natural enemies, including diseases, parasites, and predators (primarily the clerid beetle) can help maintain beetle populations at endemic levels. However, these forces seem to have relatively little effect during the early stages of an epidemic when SPB populations explode faster than parasite and predator populations respond to the availability of new host beetle levels. Ultimately, however, these biocontrol agents catch up with and actually exceed the abundant host beetles (food source) and contribute to the collapse of the epidemic. Most major outbreaks last three to five years and occur in irregular cycles of about seven to ten years, sometimes longer in the mountain region.

The SPB attacks all species of pines including white pine, but prefers loblolly, shortleaf, Virginia, and pitch pines all of which are native to the CNF. Pine is a significant component of the forested communities on the CNF and represents large portion of the CNF.

The CNF and much of east Tennessee experienced a severe outbreak of SPB between 1999 and 2002. Many of the stands in the watershed contain a component of Virginia, pitch, shortleaf, table mountain or white pine; often in small amounts which are not reflected by the given forest types. The stands affected by SPB sustained various degrees of mortality from slight to nearly total. Approximately 600 acres of this SPB affected area is planned for pine-oak restoration under existing decisions. Most of the pine mortality occurred in stands over the age of 60.

The watershed contains approximately 6,821 acres of yellow pine stands and approximately 2,483 acres of yellow pine/oak forest types for a total of 9,304 acres, which is 32 percent of the of the forested acreage. About 60 percent (5,552 acres) of the yellow pine dominated acreage is over the age of 60.

The watershed contains approximately 3,077 acres of Virginia pine stands and approximately 1,070acres of Virginia pine oak forest types for a total of 4,148 acres. About 55 per cent (2,260 acres) of the Virginia pine dominated acreage is over the age of 60. Virginia pine is shorter lived than other yellow pine species such as shortleaf and pitch pine. The older Virginia pine stands tend to be overstocked and are at risk of SPB infestation.

Desired Future Condition

Forest health in general, can be maintained in the watershed by improving the age class distribution, maintaining basal area at healthy levels, and treating HWA as it occurs.

Age Class Distribution

The DFC for a healthy forest would include the more balanced age class distributions prescribed in the RLRMP. Overall, approximately 78 percent of the forested acres in the watershed are over 70 years old, and 4.2 percent of the forested acres are 0 to 10 years old.

MP 7B contain 8,870 acres within this watershed that are suitable for timber management but have no early successional requirements. There may be opportunity for vegetation management for forest health, wildlife habitat or other reasons.

There are approximately 8,086 acres of MP 8B in the watershed, of which approximately 420 acres are in the 0 to 10 year age class. There is an opportunity for an additional 386 to 952 acres in the 0 to 10 age class.

There are approximately 271 acres of MP 9H in the watershed, of which approximately 2 acres are in the 0 to 10 year age class. There is an opportunity for an additional 9 to 25 acres in the 0 to 10 age class.

Other management prescriptions in the watershed are unsuitable. MP's 5.A, 7.A, 7.D, 9.F 11 and 12.B allow limited vegetation management for purposes other than timber production. MP 1.A, wilderness allows no management.

Maintaining a balanced age class distribution and healthy stocking levels in oak forest types would reduce the risk of gypsy moth and oak decline. Approximately 41 percent of the forested acres (11,982 acres) are occupied by oak and oak dominated mixed stands that are over the age of 70.

Maintaining a balanced age class distribution and healthy stocking levels in pine forest types would reduce the risk of SPB outbreak. Approximately 60 percent (5,552 acres) of the yellow pine dominated acreage is over the age of 60.

Hemlock Wooly Adelgid

The DFC for hemlock would be to protect its existence as a viable tree species in the watershed given the inevitable spread of hemlock wooly adelgid.

Opportunities

The mix of habitat measured at the landscape scale is not in the optimum ratio to promote desired plant and animal species.

Recommendations/Priorities

Regenerate stands in the older age classes using even aged and two aged regeneration methods. Concentrate regeneration efforts in oak dominated stands greater than 70 years old, and in yellow pine stands greater than 60 years old. There is an opportunity to regenerate as much as 952 acres in 8B, and 25 acres in 9F. There may be opportunities for vegetation management in other MP's that are unsuitable but permit these activities. There may be opportunities to promote table mountain pine, and regenerate Virginia pine stands and restore them to shortleaf or pitch pine. Use artificial regeneration (planting) to establish shortleaf pine on appropriate sites. Maintain oak and pine dominated forest types with periodic prescribed fire.

Intermediate treatments such as commercial and noncommercial thinning can be used to reduce basal area in overstocked stands. There may be opportunities in the MUTR for the enhancement of advanced oak regeneration by using midstory treatments.

Resource Management Programs

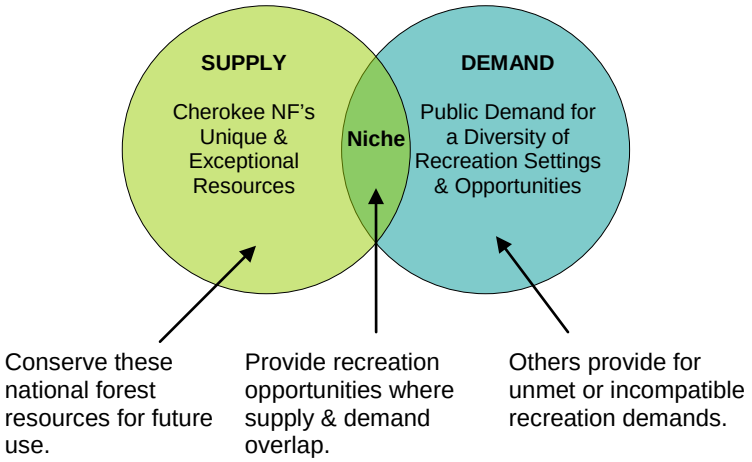
Recreation Related Programs

Developed and Dispersed Recreation
Wilderness and Roadless Areas
Scenery
Special Areas

National Wild and Scenic Rivers

Existing Condition

In January 2003 the Southern Region of the Forest Service initiated a process on the CNF to align recreation infrastructure and operations with current recreation demands and business principles. This alignment process focused on the development of a forest-wide niche statement to guide forest level programmatic changes. The term "niche" was used to define where public demand for outdoor recreation opportunities overlapped with the supply of CNF resources. See diagram.



In August 2003 the niche statement was finalized and identified five recreation opportunities to feature in CNF - water-based recreation, sightseeing, trails, camping, and fish & wildlife related activities. Since then, recreation planners and managers have divided the national forest into fifteen unique recreation zones to help determine where to accommodate these activities. Notable waterways, land forms, travel routes, surrounding communities and land uses were all examined to help define each zone and its potential niche.

For example, recreation zones containing large tracts of remote backcountry with congressionally designated Wilderness created a suitable niche for backpacking and other trail related experiences. Other zones that encompass rivers supported an inherent niche for whitewater adventure based activities. Presently, the niche for some recreation zones are clearly defined and realized with existing infrastructure and programs. Other zones require additional planning to determine the niche that would contribute to the overall forest goal of providing a "spectrum of high quality nature-based recreation settings and opportunities." (USDA 2004a)

The Tellico River recreation zone is one of seven zones identified within the proclamation boundaries of the southern section of CNF. This zone is bound by County Road 512 (Rafter Road) to the north encompassing Indian Boundary Recreation Area and Cherohala Skyway (State Highway 165) from Tellico Plains, TN to the state line. The Tellico River with its 18-mile road corridor defines the interior of the zone and is the major recreational component of the MUTR.

For context, the North River and Bald River corridors, Bald River Gorge Wilderness and Upper Bald River Wilderness Study Area are also part of the Tellico River recreation zone, but they are

not the assessment area. The adjoining recreation zones include Citico Creek recreation area to the north which features a niche for remote backcountry recreation opportunities and Coker Creek recreation zone to the southwest featuring cultural and heritage related recreation opportunities. The Nantahala National Forest is located to the east featuring the Upper Tellico OHV Area and headwaters of Tellico River. The recently established Benton MacKaye Trail traverses all three of these recreation zones.

The majority of the developed recreation infrastructure in the Tellico River zone was constructed in 1930s by the Civilian Conservation Corp (CCC). These facilities were not designed to meet the recreation demands of the 21st century, but occupy key locations throughout the zone. The changing demographics of visitors to the Tellico recreation zone have changed since the 1930s and even more recently since the construction of the Cherohala Skyway. The emerging mix of urban and rural demographics has increased the demand for a wider variety of recreation opportunities. Conflicting demands are eminent between user groups and the related supporting businesses.

Based on National Visitor Use Monitoring Results for CNF in August 2003, the urban markets support specialized recreation activities such as mountain biking, whitewater adventure and weekend backcountry excursions. Rural markets generally support fishing, off-road vehicle use and hunting. More generalized recreation activities such as sightseeing with day-hikes and scenic drives are supported by both markets.

The Forest Service in the process of developing and realizing a strategy to improve and align recreation infrastructure to respond to a niche of sightseeing, camping (all development levels), fishing & seasonal whitewater kayaking in Tellico River zone; heritage related recreation opportunities in Coker Creek zone; fishing, equestrian use and backcountry hiking and backpacking in Citico Creek zone. This would include updating bulletin boards at campgrounds that are outdated and would provide more information for users within the district. Information boards are not available at trailheads. Additionally, there are no information boards/kiosks at Stateline Campground or the state line on the Cherohala Skyway entering CNF from Nantahala National Forest.

Desired Future Condition

In 2004 a recreation strategy was developed to manage day use and overnight use of the Tellico River Corridor. This strategy was developed in cooperation with the Nantahala National Forest to acknowledge their management of the Upper Tellico OHV Area trail system located immediately across the state line from CNF. The CNF strategy conceptually divided the Tellico River corridor into 3 sections defined by the two major sightseeing attractions – Bald River Falls and Pheasant Fields trout rearing ponds (see figure)

- Section 1 - Day-use activities only Cherohala Skyway to North River Check Station featuring sightseeing; fishing; seasonal kayaking; and day hikes.
- Section 2 - Day-use activities featured up to Pheasant Fields with overnight-use in designated areas away from road.
- Section 3 - Overnight-use featured with developed roadside campgrounds from Pheasant Fields up to state line and Upper Tellico OHV Area.

Phase 1 was implemented in 2006. Six roadside campgrounds were constructed and reconstructed upstream from Pheasant Fields to accommodate the diversity of overnight demands including small group gatherings. Phase 2 was initiated in 2008 to provide a dump station and potable water services for all overnight uses in the river corridors. The facility is located at the site of the Tennessee Wildlife Resource Agency's North River check station. Phase 3 is scheduled for survey and design in 2009 and construction in 2010. This phase will construct an observation platform for Bald River Falls and day-use site at Baby Falls.

Opportunities

Baby Falls day-use area and road alignment: 2009-10

Bald River Falls observations area: 2009-10

Enhance Benton MacKaye Trailhead at Pheasant Fields

Bioengineer soft infrastructure to protect riparian resources in a manner that facilitates seasonal kayak use and other seasonal uses i.e. near bridge, Oosterneck, etc.

A design for signs that interpret bear awareness and food storage regulations has been conceptualized for installation on picnic tables, but not pursued. Budget for the signs to be designed, fabricated and installed in cooperation with Tennessee Wildlife Resources Agency.

Tellico Service Center will provide a place for visitors to dispose of their trash - making pack it in-pack it out easier.

Benton MacKaye Trail is the best example of creating a recreation opportunity by networking existing trails with minimal construction of connector trails. Provide secure BMT trailhead parking at Pheasant Fields. Create and promote an overnight loop option along Sycamore Creek and link to the Whigg in 12.B?

Evaluate user proposed trail opportunities on digitized GIS layer. Evaluate equestrian trail opportunities offering less than 12 miles of trail (3 hours riding time) as per trail strategy.

Develop trail opportunity plans to initiate trail projects. Consider Warriors Passage in regard to other trail opportunities connected to the watershed. It was once a loop with Basin Lead and/or Gravelstand Top.

Install visitor information BB at Stateline on Cherohala Skyway and Upper Tellico OHV Area. Install visitor information BB at prominent trailheads, campgrounds, and other high use areas.

Develop self guided tours, i.e. rentable ipods or mp3.

Tap into youth organizations such as 4-H clubs, local Boys and Girls Clubs, and Boy Scouts.

Continue strict enforcement of food storage regulations. Install cable food storage system in wilderness areas and backcountry.

Purchase more bear resistance garbage cans for developed areas.

Recommendations/Priorities

Identify desired recreation activities for each recreation zone and align facilities, roads and trails to provide these opportunities to standard.

Develop trail management objectives for foot trails that facilitate sightseeing, fishing and backpacking. Consider removing foot trails that don't support these activities from the National

Forest Trails System i.e. Basin Lead Trail. Develop trail management objective for equestrian trails >12 mile if desired.

Develop and implement plans that network trails, roads and trailheads to facilitate desired backcountry trail opportunities. Develop and provide website information on how to day hike or overnight hike in Bald River Gorge. Include findings in design criteria for FY10 capital improvements at the falls.

Complete and implement Tellico River Fishing Trail Complex Plan for 12.B area between North River Road and Cherohala Skyway (connected, but located just outside assessment area)

HWA is the greatest threat to scenic integrity. Kudzu is also a growing threat. Determine feasible options for reducing the visual impacts from removing hazard trees over time. Implement noxious weed control measures in corridor.

Remove hemlocks as necessary and treat slash in high developed recreation areas. Time is needed to rehabilitate areas with pine beetle and fire impacts.

Maximize use of native plants in developed recreation sites.

Determine locations and designs of BB i.e. 3 panel, single panel, etc. Possibly partner with local Boy Scout groups for eagle projects allowing them to fabricate boards. Provide information to visitors about what else there is to do on the district. Maps indicating "you are here" and what their options are from that location.

Partner with local chamber of commerce or visitor centers to provide and rent technological equipment i.e. ipods, mp3 player for self guided tours. Develop partnerships with local user groups to assist with providing interpretive media.

Provide environmental education opportunities to youth (4-H clubs, Boy Scouts, Boys and Girls Clubs) organizations and provide them opportunities to gain "points" for free camping or other district "goodies" for them giving to the district in the form of litter pick up or trail work.

Work with GRSM to determine construction costs, labor, maintenance involved with cable food storage system for backcountry camping in wilderness areas. Determine timeline and budget for installation and maintenance.

Reevaluate current trash contract and opportunities to do it cheaper and more efficient. Possibly purchase and install trash compactor at bone yard.

Heritage Resources

Existing Condition

Although there has not been a systematic, complete survey, inventory and evaluation of the archaeological and historic heritage resource sites of the study area, numerous archaeological sites dating from approximately 8000 B.C. to standing CCC-era structures (1933-1942) have been recorded throughout MUTR. These include, literally, hundreds of archaeological sites that record the use of this area by Indians, principally for the purposes of hunting and gathering wild plant foods, from 8,000 B.C. to the terminal occupation of the area by the Cherokee Indians in 1818. A lesser number of historic Euro-American sites, principally farmsteads that existed for only one to three generations (1818 to the early 20th Century), also have been documented throughout the study area.

Important historic sites are documented in the MUTR. Perhaps one of the most important of these historic sites, located on private land adjacent to the town of Tellico Plains, Tennessee, known as the Stokely Bottoms, is the historic Cherokee town of Great Tellico (occupied from approximately A.D. 1650 to 1818) which is located directly on the route of the historic Unicoi Turnpike.

Located, upriver in this portion of the study area on the CNF is the historic Tellico Ranger Station, CCC camp F-1, the first CCC camp in Tennessee and one of the first constructed in the nation. As the present Forest Service Tellico Ranger Station, it retains the original CCC period landscape and eight of the original historic CCC buildings; seven of which are presently used by the Forest Service for administrative purposes (and of these, one as a reception/visitor center for the public), while the remaining CCC structure has been recently rehabilitated for use principally as a lodging and research facility by institutions, colleges and universities who wish to use it as a short- and long-term stay facility for research and study of the various resources of the forest ecosystem of the Southern Appalachian Mountains.

Also located in the MUTR, is a portion of the Cherohala Skyway which extends from Tellico Plains, Tennessee, to Robbinsville, North Carolina. Installed at many of the overlooks along this road is wayside signing that interprets the geology, history, land use and ecology of this portion of the Southern Appalachian Mountains.

Historic heritage resources in Upper Tellico River study area include the CCC Dam Creek picnic area, which preserves a classic CCC period chestnut heavy timber picnic shelter as well as other picnic and camping sites. Located upriver from Dam Creek is the Spivey Cove Recreation Site. Used today as a camping and picnic area by the public, it also contains the archaeological remains of a CCC camp. Situated farther upriver in this portion of the study area is the historic Pheasant Fields fish hatchery. The hatchery now contains trout rearing pools managed by the Tennessee Wildlife Resources Agency.

Running along the Tellico River and all through the MUTR study area is NFSR 210. This paved road follows, and in many cases is, the original railroad grade for the logging railroad established here by the Babcock Lumber Company and its subsidiary, the Tellico Lumber Company in the early 20th Century. As such, it served as the principal means by which the Babcock Lumber Company logged out the entire 49,000 acres of this portion of the Tellico River basin of all commercial timber prior to 1923, only after which these devastated lands were acquired by the Forest Service, forming the core of the present Tellico Ranger District of the CNF.

Desired Future Condition

Pursuant to and in fulfillment of existing federal laws and regulations (Sections 106 and 110 of the National Preservation Historic Act, as amended) a complete survey, documentation, evaluation and prioritized management system of the heritage resources should be implemented for the entire study area in order to protect and, where feasible, enhance the historic properties situated in the study are that are determined eligible for listing in National Register of Historic Places. Complementary to this program, it would also be desirable to develop an interpretive program for the public of the history and forest ecology of the study area. This interpretive program could be centered on the reception center/museum area of the Tellico Ranger Station and the Visitor Center and Charles Hall Museum located in Tellico Plains.

Opportunities

Because it provides a large contiguous segment under single (federal) ownership of a major Southern Appalachian drainage (the Tellico River), the MUTR provides an ideal location for the systematic survey, documentation, and evaluation of the prehistoric and historic heritage resources of the study area. In this regard, the investigation of the aboriginal use of the numerous rock shelters located along the Tellico River (a nearly unique geological feature for the region) could prove particularly productive.

It is believed that the process of systematic inventory and evaluation of the heritage resources of the MUTR can be best and most efficiently achieved by establishing an ongoing, multi-year partnership with local universities or colleges. Toward that end, the newly established research center located at the Tellico Ranger Station would provide an ideal central location for housing university partners who would work with the Forest Service to accomplish this goal.

Additionally, the Tellico River Road (NFSR 210) and the Cherohala Skyway provide ideal venues where various interpretive programs (wayside signing, ipod broadcast interpretation, etc.) could be implemented for the public.

Recommendations/Priorities

The inventory, documentation and preservation of significant historic properties are a priority required of the Forest Service pursuant to and in compliance with Sections 106 and 110 of the National Historic Preservation Act, as amended, and the CNF RLRMP. Toward that end, the Forest Service has established a Programmatic Agreement with the Tennessee State Historic Preservation Office for the identification and preservation of significant heritage resources located in areas in which significant ground-disturbing activities are proposed.

However, this established processed does not provide for a systematic, full inventory and complete evaluation of these heritage resources. In order to more fully quantify and qualify the heritage resources of the CNF, identify those heritage resources determined to be significant, and thereby prioritize the management of the heritage resources of the Forest, it is recommended, as discussed above, that a ongoing, multi-year partnership be established with one or more universities and/or colleges to establish an archaeological field research program with the ultimate goal of surveying the entire study area in order to identify, test and evaluate the heritage resource sites of the study area.

Forest Products

Existing Condition

The MUTR contains existing forest conditions which could require vegetation management to meet various RLRMP objectives (12.02, 17.01, 17.02, 17.03, 17.05, 17.06, and 17.08). Table 15 displays the existing number of acres within the MUTR that that could potentially be treated to meet RLRMP objectives. These acres are generally associated with the 7B, 8B and 9H Management Prescriptions. Some opportunities for management exist in other prescription areas as well.

Table 15. Existing Condition Associated with RLRMP Objectives

RLRMP Objective	Potential Acres in Existing Condition
12.02	12,565
17.01	172
17.02	1,511
17.03	1,910
17.05	2,215
17.06	1,694
17.08	900

The existing forest age class distribution of the assessment area indicates that 78 percent of the forested acres are over the age of 70 years. About 4.2 percent of the assessment area is in the 0 to 10 year age class, with most of this acreage occurring in the prescriptions 7B, 8B and 9H.

MP 7B contain 8,870 acres within this watershed that are suitable for timber management but have no early successional requirements. There may be opportunity for vegetation management for forest health, wildlife habitat or other reasons.

There are approximately 8,086 acres of MP 8B in the watershed, of which approximately 420 acres are in the 0 to 10 year age class. There is an opportunity for an additional 386 to 952 acres in the 0 to 10 age class.

There are approximately 271 acres of MP 9H in the watershed, of which approximately 2 acres are in the 0 to 10 year age class. There is an opportunity for an additional 9 to 25 acres in the 0 to 10 age class.

Other management prescriptions in the watershed are unsuitable. MP's 5A, 7A, 7D, 9F 11 and 12B allow limited vegetation management for purposes other than timber production. MP 1A wilderness allows no management.

Thinning, uneven aged regeneration, savanna restoration and other treatments to meet RLRMP objectives may produce timber volume.

Desired Future Condition

A range of 395 to 977 acres of the assessment area should be in an early succession condition to meet habitat and ecological conditions/objectives associated with the RLRMP. Vegetation management treatments needed to implement the early successional habitat objective would result in a timber harvest of about 4,740 ccf every ten years if the minimum amount of 0 to 10 year age class was needed and produced, but could be as high as 11,724 ccf if the maximum amount of 0 to 10 year age class was needed and produced. Thinning and other treatments needed to meet RLRMP objectives could produce additional volumes of sawtimber and pulpwood.

Opportunities

A range of 395 to 977 acres of the assessment area would be in an early succession condition to meet habitat and ecological conditions/objectives associated with the RLRMP. Vegetation management treatments needed to implement the early successional habitat objective would result in a timber harvest of about 4,740 ccf every ten years if the minimum amount of 0 to 10

year age class was needed and produced, but could be as high as 11,724 ccf if the maximum amount of 0 to 10 year age class was needed and produced. Thinning and other treatments needed to meet RLRMP objectives could produce additional volumes of sawtimber and pulpwood.

Recommendations/Priorities

Special Uses/Lands

Existing Condition

There are 4 spring box special use permits in the MUTR.

There are no communication use sites within the MUTR

One TVA Transmission line crosses Middle Tellico. There are many power lines and telephone lines in the MUTR

National Forest System ownership is 99% in Upper Tellico and 52% in Middle Tellico. There are 9 in-holdings and several private tracts that National Forest System lands surround on three sides. The District has prepared and maintains a Land Ownership Adjustment Map (LOAM)

There are unknown miles of property lines to R8 standard in the MUTR. Unknown miles of property lines need to be maintained to standard. They are not on any scheduled rotation at this time. They are marked and surveyed on an as needed basis.

Currently there are no utility corridors or communication sites in the 12.B areas in MUTR.

Desired Future Condition

To encourage wells on private land and to eliminate the existing spring boxes because of the possibility of ground water contamination

Existing communication sites and utility corridors will be used whenever possible and new locations will be minimized as much as possible.

To acquire as many of the in-holdings and private lands that we surround on three sides as possible.

Bring all landlines up the R8 Standard and maintain them on an 8 – 10 rotation.

Document during landline maintenance and work to resolve within funding constraints.

Not to have any utility corridors or communication/electronic sites in 12.B areas.

Opportunities

When existing permits expire, issue new permits for 10 years giving permittees time to obtain an alternative source of water.

Work with utility companies during screening process on new request to protect the scenic quality.

Acquire school tract at Johns Creek. Use LOAM to direct people wanting to exchange land to tracts that we desire to acquire

Seek additional NFLM funding to meet desired future conditions of lines maintained to standard

Work with private land surveyors to provide information on property corners and landlines as they survey adjoining tracts.

Require a landscape management plan with screening, feathering, and other vegetation management techniques to mitigate the visual and other impacts of any new utility corridors or communication/electronic sites in 12B.

Recommendations/Priorities

Seek funding for running property lines to R8 standard and maintaining them on an 8 – 10 rotation.

Special uses are authorized in 12.B areas if consistent and compatible with the goals and objectives of these areas.

Prescribed and Wildland Fires

Existing Condition

Fuels conditions in the watershed vary. Portions of the area have been treated regularly within the last ten years, while others have no history of burning or mechanical fuels treatment (Table 16). Fuel loading in untreated areas ranges from 3-4 tons/acres to 12-15 tons/acre. The lower fuel loading occurring in the oak and oak-pine forests, while the higher loading can be attributed to the area impacted by SPB, occurring within predominantly pine and pine-oak forest type. Condition classes in previously treated burn units range from class-1 to class-2.

Table 16. Fuel Treatment Units

UNIT	ACRES	TREATMENT HISTORY	OPPORTUNITIES	CURRENT CONDITION
T-16 Henson Mtn	559AC	Jan 1999 230AC	Broadcast Burn with 3-5 year rotation.	Condition Class-2
T-17 Big Ridge	1905AC	None	Broadcast Burn with 3-5 year rotation	Condition Class-2/3
T-18 Natty	1211AC	None	Broadcast Burn with 3-5 year rotation	Condition Class-2/3
T-19 Buck Branch	1086AC	Feb 1999/500AC Nov 2006/661AC	Broadcast Burn with 3-5 year rotation	Condition Class-1
T-20 Miller Mine	673AC	Mar 2001/673AC	Broadcast Burn with 3-5 year rotation	Condition Class-2
T-21 Turkey Creek	1092AC	None	Broadcast Burn with 3-5 year rotation	Condition Class-2 & 3
T-22 Buck Horn	1120AC	Mar 1998/150AC Mar 2007/1120AC	Broadcast Burn with 3-5 year rotation	Condition Class-1

Table 16. Fuel Treatment Units

T-23 Butler Knob	1555AC	Mar 1998/280AC Mar 2001/1342AC Mar 2006/1555AC	Broadcast Burn with 3-5 year rotation	Condition Class-1
T-25 McNabb	2073AC	Mar 2005/2068AC Mar2008/2000AC	Broadcast Burn with 3-5 year rotation	Condition Class-1
T-26 Brushy Ridge	2068AC	Mar 2003/2068AC Mar 2006/2068AC	Broadcast Burn with 3-5 year rotation (Quicker rotation recommended due to concentrated SPB impact)	Condition Class-1/2
T-29 Gravel Stand	1639AC	Mar 2003/1639AC Mar 2007/1639AC	Broadcast Burn with 3-5 year rotation	Condition Class-1
T-30 Basin Lead	916AC	None	Broadcast Burn with 3-5 year rotation	Condition Class-2/3
T-33 Short Cut	524AC	None	Broadcast Burn with 3-5 year rotation	Condition Class-2/3

Desired Future Condition

Areas adjacent to private land are the highest priority for treatment. Ideally these will be brought to condition class-1. Non-government properties have the highest potential for negative impact from wildfire occurrence due to the urban interface and other improvements adjacent to the forest.

Opportunities

Fuel loadings in untreated areas ranges from 3-4 tons/acres to 12-15 tons/acres.

Recommendations/Priorities

Continue fuels treatment through prescribed burning. Establish a rotation of 3 to 5 years between treatments of established burn units.

Continue to monitor the effects of prescribed burning through plot sampling and measurements.

Roads and Access

This resource program is addressed in Appendix B - RAP.

Key Opportunities/Priorities (developed after report is finished)

Numerous monitoring projects that can move forward without NEPA. Suggestion to begin baseline study on loss of Hemlock affect on streams- not just for MUTR. Another suggestion was to begin insect study to determine degree of recovery from OHV area closure. Recreation projects are not yet ripe for decision although trail management appears to be an issue that needs to be addressed.

Projects to continue field review and potential proposed action development are:

1) Vegetation management for forest health and wildlife issues;
2) Whigg Meadow management plan development and implementation;
3) Rhododendron trimming in streams; and
4) Pursue research project by harvesting in stands above 3,000 ft elevation.

Appendices

A Opportunity Table
B RAP

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Minerals
None

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Recreation Related Programs
None
Heritage Resources
None
Forest Products
None
Special Uses/Lands
None
Prescribed and Wildland Fires
None

Middle/Upper Tellico Rivers Ecosystem Assessment

2004 Revised Plan Goals & Objectives	Existing Condition	Opportunities	Possible Management Practices
GOAL 1 Watersheds are managed (and where necessary restored) to provide resilient and stable conditions to support the quality and quantity of water necessary to protect ecological functions and support intended beneficial water uses.	See objectives	See objectives	See objectives
OBJECTIVE 1.01 Soil and water improvement needs (necessary to help restore watershed condition) are prioritized annually based on findings in watershed analyses. Collaborate with adjacent landowners to identify and prioritize watershed improvement projects affecting multiple ownerships.	Laurel Creek and Turkey Creek are turbid after heavy rain events. These two streams are adding to Tellico River issues. Source is unknown at this time.	Work with TDEC, NRCS, and Private land owners to determine source and impacts.	TBD
	Impacts to the Upper Tellico River are being determined by NFNC.	Monitor Tellico River in TN to determine impacts to water quality from the OHV area. Collaborate with NFNC. Also, work with TDEC. Potential partners are USGS, EPA, and TVA.	Work with NC to mitigate effects from Upper Tellico OHV Area (UTOHV)
	Green Cove Community is located adjacent to the Tellico River	Determine if the Green Cove Community is impacting water quality.	Work with Green Cove Community if there are issues
OBJECTIVE 1.02 In 5th level watershed with impaired waters, examine possible partnership opportunities with state and local agencies and other interested individuals and entities to address impairment issues.	No state impaired waters	Look for partnerships to maintain/improve current status of Tellico River	TBD

2004 Revised Plan Goals & Objectives	Existing Condition	Opportunities	Possible Management Practices
OBJECTIVE 1.03 Any specific soil and water mitigation needed (in addition to Forest plan direction) for source water protection watersheds will be determined as watershed assessment and project planning is completed.	Tellico River is a Domestic Water Source from mile 0.0 to mile 41. Determine impacts to water quality from UTOHV, and roads.	Develop partners with other agencies to monitor water quality. (TVA, USGS, EPA)	Create dips, wing ditches, and turnouts to prevent road runoff from reaching streams.
OBJECTIVE 1.04 Cooperate and coordinate with state and local agencies in the development of science based Total maximum daily Loads (TMDLs) for impaired waters with national forest ownership in the watersheds.	No impaired waters	None	None
GOAL 2 Manage instream flows and water levels, by working with other agencies if possible, to protect stream processes aquatic and riparian habitats and communities, and recreation and aesthetic values	See objectives	See objectives	See objectives
OBJECTIVE 2.01 The instream flows needed to protect stream processes, aquatic and riparian habitats and communities, and recreation and aesthetic values will be determined on selected streams as identified by the CNF.	No diversions with the exception of the TN state fish hatchery dam/diversion on Sycamore Creek	None	None

2004 Revised Plan Goals & Objectives	Existing Condition	Opportunities	Possible Management Practices
GOAL 3 Maintain or improve watershed condition and stream channel conditions to limit the amount of sediment to levels that will not adversely affect channel capacity, beneficial uses of water and regulatory designations (ORNW/Wild and Scenic etc.)	Improvement to the UTOHV upstream from assessment area will be determined by NFNC. Sediment is being added to Tellico River by Laurel Creek and Turkey Creek. Some roads are impacting streams due to ditch lines leading directly to streams. (Ex. Wildcat Creek Rd. impacting Tellico River).	Monitor impacts to Tellico river channel from the OHV area. Share data with NFNC. Work with TDEC, NRCS, and Private land owners to determine source and impacts Notify forest road engineers and road maintenance contractors about this issue.	If possible mitigate effects from UTOHV. TBD Create dips, wing ditches, and turnouts to prevent road runoff from reaching streams
GOAL 4 Restore streams that are degraded from acidic impacts or other perturbations to meet their intended beneficial uses.	No known acidic issues. Sedimentation from UTOHV		Mitigate effects from UTOHV
GOAL 5 Stability of stream banks and channels is protected during management activities. Channeled ephemeral stream zones are managed to minimize sediment transport.	See objectives	See objectives	See objectives
OBJECTIVE 5.01 Channeled ephemeral streams are managed in a manner that retains and provides for the recruitment of large woody debris.	Follow Plan		
OBJECTIVE 5.02 Soil disturbing activities are implemented and facilities are maintained to minimize impacts to the channeled ephemeral stream zone.	Follow Plan		
GOAL 6 Design and implement projects in ways that will maintain or improve the long-term productive capacity of the soil resource.	Follow Plan		
GOAL 7 Management activities will be designed to minimize air pollution originating on the CNF.	Follow Plan		
GOAL 8 During mechanical disturbance on all soils dedicated to growing forest vegetation, the organic layers, topsoil and root mat will be left in place over 85 percent of a project area.	Follow Plan		

2004 Revised Plan Goals & Objectives	Existing Condition	Opportunities	Possible Management Practices
GOAL 9 Consider evaluating opportunities for restoration of canebrakes through watershed assessments.	No existing canebrakes however some cane is present in riparian areas	No appropriate locations to restore to canebrakes	None
GOAL 10 Maintain and restore natural communities in amounts, arrangements, and conditions capable of supporting viable populations, of existing native and desired non-native plants, fish, and wildlife species within the planning area.	Documented fish extirpations See 9.F/9.H/18	Restore some fish sp. to Upper Tellico See 9.F/9.H/18	
GOAL 11 Encourage maintenance of forest as a land use on private lands within and surrounding national forest through land acquisitions, agreements, and education, in order to maximize benefits of national forest lands to area sensitive forest interior species.	Upper T 99% ownership Middle T 52% ownership w/in proclamation boundary 66% In holdings and tracts adjacent to NFS land has been converted from a forest use to subdivision. This trend will continue for the foreseeable future.	Acquire lands as available If we are contacted ahead of time, encourage larger tracts in subdivisions	Work in cooperation with the Tennessee Division of Forestry on this issue
GOAL 12 Provide breeding, wintering, and migration staging and stopover habitat for migratory birds in ways that contributes to their long-term conservation.	See objectives	See objectives	See objectives
OBJECTIVE 12.01 Maintain at least 1000 acres above 3000 feet elevation in habitats characterized by grassy/herbaceous ground cover. This acreage may be comprised of open woodlands, savannas, and grasslands; old fields; and regenerating forests (0-10 years old).	6211 acres above 3000 124 acres 0-10 9 acres in 2 openings	Create 0-10 Maintain existing acres. Create woodlands.	Harvest, mow, burn, herbicide,
OBJECTIVE 12.02 During the first ten years of plan implementation, cooperate with U.S. Fish and Wildlife Service to increase structural habitat diversity in up to 5 percent of closed-canopied mid-and late successional mesic deciduous forest, including old growth restoration areas, by retaining large trees and creating small canopy gaps suitable for Cerulean warbler and associated species.	12565 acres mid/late mesic deciduous forest	Create up to 628 acres	Small group or single tree selection Thinning from above
GOAL 13 Maintain or increase habitats for those species needing large, contiguous forested landscapes, and where the management of NFS Lands can make a difference in their populations and viability.	See objectives	See objectives	See objectives
OBJECTIVE 13.01 No new additional open road access will be provided in bear reserves. No motorized public off road use will be allowed in bear reserves.	No bear reserve	None	

2004 Revised Plan Goals & Objectives	Existing Condition	Opportunities	Possible Management Practices
GOAL 14 Contribute to conservation and recovery of federally listed threatened and endangered species, and avoid actions that would lead to federally listing of other species under the Endangered Species Act.	See objectives	See objectives	See objectives
OBJECTIVE 14.01 In cooperation with partners develop and implement monitoring plans for all T&E species during the next 10-year period. Develop and implement conservation strategies for sensitive species or groups of species.	USGS report complete on 9.F area	Consider recommendation s from USGS report	TBD
OBJECTIVE 14.02 Provide upland water sources approximately every 0.5 miles, to provide an important habitat element for wildlife, including the endangered Indiana bat. Waters sources are comprised of both permanent ponds and ephemeral pools and are often located in openings or near road corridors that allow access by bats.	Green Cove, Whigg, Johns Creek, Quarry, Rough Ridge pond, Tellico Lake	Create upland water sources	
OBJECTIVE 14.03 The following objectives are established to contribute to the recovery of threatened, endangered and candidate species over the life of the LMP.	See table in plan also 14.01	No T&E plants	None
GOAL 15 Minimize adverse effects of invasive non-native species. Control such species where feasible and necessary to protect national forest resources.	See objectives	See objectives	See objectives
OBJECTIVE 15.01 Document the presence absence of the following invasive species during project level inventories.	Currently documenting	Continue with surveys	Continue with surveys
OBJECTIVE 15.02 Control non-native and unwanted native species, where they threaten TES elements ecological integrity of communities, or habitats created for demand species.	See known sites GIS layer	Control	Implement NNIP EA
GOAL 16 Manage through protection, maintenance, or restoration, a variety of large, medium, and small old growth patches to provide biological and social benefits.	See objectives	See objectives	See objectives
OBJECTIVE 16.01 Map patches as discovered, of old growth identified during stand examination. Complete field verification of possible existing old growth areas in our current inventory.	No known OG Approximately 464 acres of possible OG in unsuitable Rx. 35 acres in Suitable.	Map as discovered. Nothing shows up in the area of the SAFC Sugar Mtn proposal.	Designate as needed on unsuitable acres. Only Consider if existing found on suitable acres.
GOAL 17 Restore and maintain forest communities to those plant communities predicted as most likely to occur based on the ecological potential of the site potential natural vegetation.	See objectives	See objectives	See objectives
OBJECTIVE 17.01 Over the ten-year period, restore at least 5000 acres of diverse native communities appropriate to sites currently occupied by white pine plantations.	172 acres	Thin or regenerate	Thin or regenerate
OBJECTIVE 17.02 Over the 10-year period, restore oak or oak-pine forests on at least 9,000 acres of appropriate sites currently occupied by pine plantations or other sites with minimal diversity.	1511 acres		Regen opportunities, white pine removal, TSI, burn plant oak if needed
OBJECTIVE 17.03 Over the 10-year period, restore at least 10,000 acres of shortleaf/pitch/table-mountain pine forests.	1910 acres		Timber harvest, TSI, prescribed burn

2004 Revised Plan Goals & Objectives	Existing Condition	Opportunities	Possible Management Practices
OBJECTIVE 17.04 Over the 10-year period, restore at least 300 acres to appropriate native communities currently occupied by loblolly pine plantations.	0 acres		Timber harvest and or prescribed burn
OBJECTIVE 17.05 Over the 10-year period, reduce the acreage of Virginia pine forest by at least 25,000 acres, through restoration of fire-adapted pine or oak communities.	2215 acres		Regen opportunities, TSI, tree planting
OBJECTIVE 17.06 Restore at least 5,700 acres in dry and xeric oak and pine-oak forests to open woodlands, savannas, and grasslands over a 10-year period.	1694 acres		Group selection, thinning, Rx fire
OBJECTIVE 17.07 For northern hardwood, mixed mesophytic, and river floodplain hardwood, maintain a minimum of 75 percent of total forest-wide acreage in mid- and late-successional conditions, and a minimum of 50 percent in late-successional conditions, including old growth.	8403 acres of mid/late 348 acres late		Passive objective-Consider when planning other treatments
OBJECTIVE 17.08 Thin an average of at least 100 acres per year of shortleaf/pitch pine forest, in an effort to maintain a target basal area of approximately 60-80 square feet per acre.	900 acres		Thin
OBJECTIVE 17.09 Convert fescue fields (140 acres) to native grasses within a 10-year period where practical.	30 acres of existing openings Approximately 90% with fescue	Treat fescue	Implement NNIP EA
GOAL 18 Contribute to maintenance or restoration of native tree species whose role in forest ecosystems is threatened by insects and disease. Management activities will reduce the impacts from non-native invasive species.	See objectives	See objectives	See objectives
OBJECTIVE 18.01 Encourage reintroduction of extirpated or declining native species when technologically feasible. These species include, but are not limited to, American chestnut, butternut, hemlock, dogwood, Fraser fir, and red spruce. Develop partnerships with universities, groups and other agencies to facilitate reintroduction of native species.	Consider planting Fraser fir, red spruce and chestnut. Continue treating hemlock.	Continue contact with ACF. Note butternut during exams/surveys. Continue cooperation with UT on butternut.	Consider planting Fraser fir and chestnut.
OBJECTIVE 18.02 Promote the health of susceptible forest communities by maintaining a site-specific basal area that promotes tree vigor. Encourage advanced regeneration of oak species.	Pine/pine Hdwd>= 60 years= 3206 Ac Hdwd/Hdwd pine>=70 years=9649 Ac	Stand exams to determine treatment needs	Timber harvest and Rx fire
OBJECTIVE 18.03 Use IPM (see Gypsy Moth EIS, 1995) to protect resources from damage cause by gypsy moth and other forest insects and diseases utilizing the most appropriate technique.	Not issue at this time HWA sites	HWA treatments	Remain vigilant Follow EA
OBJECTIVE 18.04 Identify and track SPB infestations and suppress where appropriate and feasible. Follow directions in SPB EIS or other current direction.	Not issue at this time		Remain vigilant

2004 Revised Plan Goals & Objectives	Existing Condition	Opportunities	Possible Management Practices
GOAL 19 Where forest management activities are needed and appropriate to achieve the desired composition, structure, function, productivity, public health and safety, and sustainability of forest ecosystems; a result of such activities will also be to provide wood products for local needs.	See objectives	See objectives	See objectives
OBJECTIVE 19.01 Provide 33,726 MCF of sawtimber per decade.	13,809 from Restoration Strategy		Harvesting
OBJECTIVE 19.02 Provide 6,242 MCF of pulpwood per decade.	Above figure includes pulpwood		Harvesting
GOAL 20 Provide supplies of those wood products including firewood where the Forest Service is in a position to make an impact on meeting the demand for those products.	Some demand.	Consider harvesting to meet objective	
GOAL 21 Use fire during dormant and growing seasons to achieve ecological sustainability, rehabilitation, and restoration of fire dependant and associated communities. Identify and establish appropriate "burning blocks" that facilitate the use of prescribed fire to maintain and restore fire dependant and associated communities.	18 established burn blocks within or partial assessment area 33,000 acres total 5,000 acres treated in past 10 years	Treat remaining 28,000 acres	Rx Burn
OBJECTIVE 21.01 Prescribe burn an average of at least 1,100 acres per year of shortleaf/pitch/table-mountain pine forest, in an effort to maintain a fire return cycle of 4-12 years.	1910 acres		Rx fire
OBJECTIVE 21.02 Prescribe burn an average of at least 5,200 acres per year of oak and oak-pine forests in an effort to maintain a 4-12 year fire return cycle.	3042 acres		Rx fire
OBJECTIVE 21.03 Prescribe burn an average of 2,600 acres per year of open *[dry and xeric oak forests*] woodlands, savannas, and grasslands, in an effort to maintain a fire return cycle of 4-12 years in dry and xeric oak forests, woodland, grasslands, and savannas. *[two objectives: create, maintain]*	533 acres		Rx fire
OBJECTIVE 21.04 Prescribe burn an average of at least 1,200 acres per year of pine-oak forests, in an effort to maintain a fire return cycle of 4-12 years.	1151 acres		Rx fire
GOAL 22 Achieve a balance between suppression to protect life, property, and resources, and fire use to regulate fuels and maintain healthy ecosystems. Use wildland fire to protect, maintain, and enhance resources, and, as nearly as possible, allow it to function in its natural ecological role.	Limited options for wildland fire sue due to 90% of fires human caused.	Develop wildfire use plan to be able to use wildfires to achieve this goal. Utilize confinement option.	Review each wildfire for potential.
GOAL 23 Fire dependent ecosystem components are maintained by desired fire regimes. Restore and maintain fire associated and dependent landscapes by moving them from condition class 2 and 3 to condition class 1.	Class 1 4935 acres Class 2 1719 acres Class 3 26225 acres	Burn Include condition class in monitoring data. Establish rotation to maintain CC1.	Burn

2004 Revised Plan Goals & Objectives	Existing Condition	Opportunities	Possible Management Practices
GOAL 24 Reduce hazardous fuels through wildland fire use, prescribed fire, and mechanical fuels treatment.	18 established burn blocks within or partial assessment area 33,000 acres total 5,000 acres treated in past 10 years. No mechanical to date. No wildland fire use to date	Develop wildfire use plan to be able to use wildfires to achieve this goal. Rx Burn. Mechanical treatments along property boundaries	Rx burn Mechanical treatments along property boundaries.
OBJECTIVE 24.01 Reduce hazardous fuels between 19,000 and 60,000 acres per year with priority given to areas affected by insects, diseases, storm damage, and along NFS boundaries with high values at risk.			
OBJECTIVE 24.02 Minimize the acreage of mixed mesophytic and northern hardwood forest prescribed burned annually, within the constraints of meeting other prescribe fire objectives and without resulting large increases in plowed or bladed fireline construction.	8,000 acres in FT.	Minimize acreage burned. Review each burn block for impacts to this FT during burn plan process.	Ignition patterns Burn parameters Containment boundary layout.
GOAL 25 Emissions from prescribed fire will not hinder the state's progress toward attaining air quality standards and visibility goals.	Use smoke screening process in each burn plan to mitigate smoke impacts Remain within state MAVs. Class 2 air quality within assessment area.	Follow burning prescription for each burn. Monitor smoke impacts outside assessment area.	Burn parameters Establish wind speed and direction in burn plan process to mitigate/maintain air quality standards.
GOAL 26 Enhance public understanding of and appreciation for CNF's natural and cultural resources and their management in order to foster their wise use and conservation.	Revised "Cherokee NF Journal" provides visitors with recreation and conservation information and features the Tellico River area.	Put "Journal" information on website and visitor information boards.	Propose projects and tasks in out year NFRW workplans for recreation visitor information. Info boards at Oosterneck and Service Center

2004 Revised Plan Goals & Objectives	Existing Condition	Opportunities	Possible Management Practices
OBJECTIVE 26.01 Develop a forest wide inventory of interpretive opportunities and facilities within five years.	Cherohala Skyway provides limited roadside interpretive opportunities. Bulletin boards at campgrounds are outdated and provide limited information. No info boards at trailheads. No info board at Stateline (OHV area) or state line on the Cherohala Skyway.	Determine information needed at Oosterneck site and Turkey Creek overlook. Panther Branch fish viewing. Install visitor information BB at state lines on Cherohala Skyway and OHV area. Install visitor information BB at prominent trailheads, campgrounds, and other high use areas.	Design and fabricate updated signs. Determine locations and designs of BB i.e. 3 panel, single panel, etc. Possibly partner with local boy scout groups for eagle projects allowing them to fabricate boards. Provide information to visitors about what else there is to do on the district. Maps indicating "you are here", and what there options are from that location.
OBJECTIVE 26.02 Develop and provide a wide range of interpretive media to enhance visitor experiences.	Limited recreation information available to the technologically advanced generation	Develop self guided tours, rentable ipods or mp3.	Maximize information available on website. Partner with local chamber of commerce or visitor centers to provide and rent equipment. Develop partnerships with local user groups to assist with providing interpretive media
GOAL 27 Provide Forest audiences with the foundation of knowledge needed to become informed participants in public lands resource management.		Continue to engage the public in recreation planning efforts, i.e. trail opportunity planning and noxious weeds awareness.	Develop plan to educate public on noxious weeds. i.e. Information press release. Flyers posted on BB. Information on web page.

2004 Revised Plan Goals & Objectives	Existing Condition	Opportunities	Possible Management Practices
GOAL 28 Build trust and credibility for the agency's programs and missions by forging connections between people and their natural and cultural heritage.	New admin facility for research/partners/cooperators/volunteers	Provide information and personal contacts at the soon to be constructed Tellico River Service Center, i.e. bear aware, fishing regulations, Leave No Trace, etc. Have ranger station open to the public on Saturdays.	Reading material for education/information provided in facility Web site. Continue to work with SAFC and other groups on building proposals.
GOAL 29 Encourage cooperation and partnerships with individuals, non-profit organizations, other agencies, special-interest groups, clubs and others to achieve the CNF's interpretive and educational mission.	Limited interpretive media available to public. New "CNF Journal" highlights Tellico River history. Ecoday/Enviro Ed programs	Cooperate with TWRA to provide educational opportunities at the new Check Station at Tellico River Service Center. Tap into youth organizations such as 4-h clubs, local boys and girls clubs, and boy scouts	TWRA, UT, expand Ecoday More Kids in the Woods programs and funding. Apply for grants NWTF Jake day TU. Provide environmental education opportunities to those youth organizations and provide them opportunities to gain "points" for free camping or other district "goodies" for them giving to the district in the form of litter pick up or trail work.

2004 Revised Plan Goals & Objectives	Existing Condition	Opportunities	Possible Management Practices
GOAL 30 Provide a spectrum of high quality nature-based recreation settings and opportunities that reflect the unique or exceptional resources of the CNF and the interest of the recreating public on an environmentally sound and financially sustainable basis. Adapt management of recreation facilities and opportunities as needed to shift limited resources to those opportunities.	Cherokee NF has been zoned into 15 recreation zones that reflect the unique or exceptional resources of CNF. The assessment area includes most of the Tellico River Recreation Zone minus Indian Boundary Recreation Area and parts of North River corridor. Minor sections of private land within Citico Creek and Coker Creek Zones are also included.	Feature recreation activities and opportunities that are of interest to the recreating public in the most suitable and capable recreation zones across the forest. Complement the recreation opportunity spectrum.	Identify desired recreation activities for each recreation zone and align facilities, roads and trails to provide these opportunities to standard.

2004 Revised Plan Goals & Objectives	Existing Condition	Opportunities	Possible Management Practices
GOAL 31 Where financially and environmentally feasible, encourage the following opportunities: water-based activities, sightseeing, camping, hunting, fishing, driving for pleasure, wildlife viewing/nature study, day-use and group facilities, non-motorized trail systems for hiking biking and equestrian use, designated OHV routes, special interest areas, interpretation and conservation education.	In 2004 a recreation strategy was developed to manage day use and overnight use of the Tellico River Corridor. Phase 1 constructed/reconstructed 6 campgrounds upstream from Pheasant Fields. Phase 2 in 2008 will construct a centralized Tellico River Service Center to provide dump station and potable water services for all CGs. Phase 3 will construct an observation platform for Bald River Falls and day-use site at Baby Falls.	Determine facilities needed to enhance day-use in the corridor – primarily fishing, seasonal whitewater kayaking, day hikes and overnight hikes i.e. BMT trailhead at Pheasant Fields and sustainable put-in and take-outs for kayakers. In 2003 GPS points were collected and a GIS layer created for all road side pull-offs and informal parking areas in Tellico River and North River Corridors.	Determine how to improve and align surveyed pull-offs to facilitate sightseeing, camping (all development levels), fishing & seasonal whitewater kayaking in Tellico River Zone; heritage related recreation opportunities in Coker Creek Zone; fishing, equestrian use and backcountry hiking & backpacking in Citico Creek Zone. Consider amendment to Forest Plan to provide O&G kayaking on Tellico River.

2004 Revised Plan Goals & Objectives	Existing Condition	Opportunities	Possible Management Practices
OBJECTIVE 31.01 Provide the appropriate site-specific combination of recreation facilities, services, public information and enforcement to minimize wildlife access to human food and trash.	Bear resistant trash cans have been installed at facilities. Food storage regulations are in effect district wide and are enforced by LEOs and FPOs.	A design for signs that interpret bear awareness and food storage regulations has been conceptualized for installation on picnic tables (like Metcalf Bottoms in GSMNP), but not pursued. Continue strict enforcement of food storage regulations. Install cable food storage system (similar to GRSM) in wilderness areas and backcountry. Purchase more bear resistance garbage cans for developed areas.	Budget for the signs to be designed, fabricated and installed in cooperation with TWRA. Tellico Service Center will provide a place for visitors to dispose of their trash - making pack it in-pack it out easier. Could offer trash bags at the service center. Work with GRSM to determine construction costs, labor, maintenance involved with cable system. Determine timeline and budget for installation and maintenance. Reevaluate current trash contract and opportunities to do it cheaper and more efficient. Possibly purchase and install trash compactor at bone yard.

2004 Revised Plan Goals & Objectives	Existing Condition	Opportunities	Possible Management Practices
GOAL 32 Develop, enhance and maintain systems of non-motorized and motorized trails within the capabilities of the land and appropriate to the desire ROS class. Emphasize multi-use non-motorized trails where appropriate and where user conflict can be minimized. Provide separate-use trails where necessary to reduce use conflicts or to improve the quality of recreation experiences.	Benton MacKaye Trail is the best example of creating a recreation opportunity by networking existing trails with minimal construction of connector trails.	Provide secure BMT trailhead parking at Pheasant Fields. Create and promote an overnight loop option along Sycamore Creek and link to the Whigg in 12.B? Evaluate user proposed trail opportunities on digitized GIS layer. Evaluate need for Basin Lead Trail and abandoned, washed out trail bridge on Tellico River.	Evaluate equestrian trail opportunities offering less than 12 miles of trail (3 hours riding time) as per trail strategy. Develop trail opportunity plans to initiate trail projects.
GOAL 33 Emphasize opportunities to create networks and loops for new trail construction.	Same as 32	Same as 32	Same as 32
GOAL 34 Manage five nationally designated trails for their unique scenic, recreational and or historic attributes. These include Appalachian National Scenic Trail, Warriors Passage National Recreation Trail, John Muir National Recreation Trail, Overmountain Victory National Historic Trail, and Unicoi Turnpike National Millennium Trail.	Warriors Passage NRT is located just outside the watershed assessment area. It is useless in its current condition due to impacts from fires and pine beetle. Although volunteers have spent some time on it this year and it is partly passable.	Consider Warriors Passage in regard to other trail opportunities connected to the watershed. It was once a loop with Basin Lead and/or Gravelstand Top.	Develop trail management objectives for foot trails that facilitate sightseeing, fishing and backpacking. Consider removing foot trails that don't support these activities from the national forest system i.e. Basin Lead Trail. Develop TMO for equestrian trails >12 mile if desired. Emphasize bike trails at Indian Boundary Rec Area outside of watershed.

2004 Revised Plan Goals & Objectives	Existing Condition	Opportunities	Possible Management Practices
GOAL 35 Manage areas to provide "backcountry" (Semi-primitive motorized and non-motorized/remote) recreation experiences that are generally not available on other land ownerships	Inventoried SPRM and RN2 within assessment area.	Manage roads and trails to provide opportunities to enhance backcountry recreation opportunities and experience.	Develop and implement plans that network trails, roads and trailheads to facilitate desired backcountry trail opportunities.
OBJECTIVE 35.01 Manage at least 75,000 acres outside designated Wilderness for backcountry recreation. (Inclusive but not limited to 12.A, 12.B, and 1.B)	6,842 acres of 12.B within assessment area. Contains roadless area and Mtn treasures.	See Goal 32 for Sycamore Creek Trail opportunity.	Complete and implement Tellico River Fishing Trail Complex Plan for 12.B area between North River Road and Cherohala Skyway (connected, but located just outside assessment area)
GOAL 36 Wilderness, recommended wilderness study area and roadless areas are managed to provide their full range of social and ecological benefits	Improve trail opportunities.	Improve trail network and trailheads.	Develop trail opportunity plan and work it.
OBJECTIVE 36.01 Utilize parameters set for management of individual wildernesses as developed through the Limits of Acceptable Change process and documented in Wilderness Implementation Schedules.	LACs are in need of updating.	Determine trailhead limitations at Bald River Falls and Cow Camp for Bald River Gorge Wilderness.	Develop and provide website information on how to day hike or overnight hike in Bald River Gorge. Include findings in design criteria for FY10 capital improvements at the falls.
OBJECTIVE 36.02 Manage approximately 20,000 acres of Recommended Wilderness Study Areas (Rx 1.B) as Wilderness until Congress decides whether or not to include the areas I n the National Wilderness Preservation System.	No 1.B in assessment area.	NA	NA
GOAL 37 Obtain full public ownership of lands within wilderness boundaries, including subsurface rights.	All land and subsurface rights within Bald River within assessment area are NFS	None	None

2004 Revised Plan Goals & Objectives	Existing Condition	Opportunities	Possible Management Practices
GOAL 38 Wild, Scenic, and Recreation Rivers which are designated by Congress, recommended for designation or are eligible for designation, will be managed to protect their free flowing nature and outstandingly remarkable values.	Tellico River is an eligible "recreation" river that had a suitability study drafted at one time, but it was not completed. TR is the recreational, heritage/cultural, botanical/ecological values are rated outstandingly remarkable and is free flowing. Currently RX 7.a, 7b, 7.d and 1.a. RM 30 (steel bridge)-48 (state line)	Determine if and when the forest would pursue initiating a new suitability study.	Coordinate with regional and national W&SR staff for additional direction and support.
OBJECTIVE 38.01 Manage approximately 41 miles of streams in the three different classifications of eligibility. Refer to Appendix D of the EIS for river classifications and their respective Outstandingly Remarkable Values.	See Goal 38	See Goal 38	See Goal 38
OBJECTIVE 38.02 During the 10 year period, complete suitability study on Tellico, Hiwassee, and Elk Rivers and Beaverdam Creek.	See Goal 38	See Goal 38	See Goal 38
GOAL 39 All inventoried roadless areas shall be managed in compliance with current rules and regulations concerning such areas.	Sycamore Creek roadless area and Mtn treasure Bald River west roadless area managed as 12.B or 9.F. 40892 proposed to decommission 40892 access chestnut scionwood and pollination site		Stay compliant with latest ruling.

2004 Revised Plan Goals & Objectives	Existing Condition	Opportunities	Possible Management Practices
GOAL 40 Conserve, maintain, and enhance the scenic and aesthetic values of the CNF.	Hemlock Woolly Adelgid is the greatest threat to scenic integrity. Kudzu is also a growing threat.	Determine feasible options for reducing the visual impacts from removing hazard trees over time.	Implement noxious weed control measures in corridor. Remove hemlocks as necessary and treat slash in high developed recreation areas.
OBJECTIVE 40.01 Within the planning period, evaluate Existing Scenic Integrity of Forest lands, including new acquisition, and set priorities to rehabilitate areas that do not meet the SIO specified by management prescription			Time is needed to rehabilitate areas with pine beetle & fire impacts. Maximize use of native plants in developed recreation sites.
OBJECTIVE 40.02 Create and maintain cleared observation points along the CNF's two scenic byways, including ten (10) existing along Cherohala Scenic Skyway and eight (8) existing along Ocoee Scenic Byway.	Cherohala Skyway overlooks are beginning to grow up.	Maintain cleared observation points along Cherohala Skyway in assessment area.	Include vegetation management as part of operating plan. In plan, determine a set time for woody encroachment to be removed and stick to it. Work with Monroe County to partner for grants
OBJECTIVE 40.03 Map lands viewed in the foreground from the CNF's nationally designated trails, including Appalachian National Scenic Trail, Warriors Passage National Recreation Trail, John Muir National Recreation Trail, Overmountain Victory National Historic Trail, and Unicoi Turnpike National Millennium Trail.	Visibility model has been conducted for the Benton MacKaye Trail. Available and can be viewed as a GIS layer.		
GOAL 41 Manage CNF to provide a variety of Landscape Character Themes with the predominant themes being Natural Appearing, Natural Evolving and variations of these themes that include Pastoral/Agricultural, Historic/Cultural, Rural/Forested and Urban.			Meet SIOs in RLRMP.

2004 Revised Plan Goals & Objectives	Existing Condition	Opportunities	Possible Management Practices
GOAL 42 Manage areas with special scenic, geological, paleontological, cultural, or heritage characteristics to maintain or restore those characteristics.	CCC built environment is present in the assessment area.	Preserve key elements of Dam Creek picnic area. And admin site.	Heritage structures and archaeological sites in the study area are managed to standards as stipulated in the National Register of Historic Places (NRHP), 36 CFR 800 and 36 CFR 296.
GOAL 43 A systemic program of heritage resource inventory, evaluation, and preservation aimed at the identification, enhancement and protection of significant heritage resource values is implemented. Integration of heritage resource management concerns is emphasized, as is coordination with the public, scientific community, ethnic groups, and interested federally recognized tribal governments.			Heritage sites and structures in the study area are inventoried, evaluated and preserved pursuant to and in compliance with the NRHP, 36 CFR 800 and the Programmatic Agreement with the State Historic Preservation Office and the Advisory Council on Historic Preservation.
OBJECTIVE 43.01 Within the 10-year period, preservation/maintenance plans are developed for historic administrative and recreational facilities.	Dam Creek recreation site needs a plan to address deferred maintenance and future recreational use.	Determine the facilities and services to be provided at Dam Creek in the future.	As Dam Creek is a historic (CCC) recreation area, a plan needs to be developed for the for the full documentation, restoration and preservation of this historic recreation site and to address deferred maintenance and future recreational use.

2004 Revised Plan Goals & Objectives	Existing Condition	Opportunities	Possible Management Practices
OBJECTIVE 43.02 Opportunities are provided for the public to observe or to participate in all phases of Forest Service heritage management. Partnerships are developed with external organizations, groups, tribes, and individuals to provide a public service through heritage resource.	Partnerships are being developed with universities, local groups and tribes to allow the public to observe and participate in Forest Service Heritage Management	Continue development of partnerships with universities, local groups and tribes to allow the public to observe and participate in Forest Service Heritage Management.	Continue development of partnerships with universities, local groups and tribes to allow the public to observe and participate in Forest Service Heritage Management.
OBJECTIVE 43.03 Provide protection for heritage sites that preserves the integrity of scientific data that they contain, for the benefit of the public, tribal, and scientific communities.	A program of protection now exists for the protection of the integrity of significant heritage sites.	Continue the program for the protection of the integrity of significant heritage sites will be maintained.	The program for the protection of the integrity of significant heritage sites will be maintained.
OBJECTIVE 43.04 Reduce the existing backlog of heritage sites needing formal evaluation.	Unevaluated heritage sites will be evaluated on a case-by-case basis pursuant to the Programmatic Agreement with the Tennessee SHPO	Unevaluated heritage sites will be evaluated on a case-by-case basis pursuant to the Programmatic Agreement with the Tennessee SHPO.	Unevaluated heritage sites will be evaluated on a case-by-case basis pursuant to the Programmatic Agreement with the Tennessee SHPO.
GOAL 44 Sound range management practices help to maintain important forest openings and aesthetically pleasing pastoral settings.	NA		
OBJECTIVE 44.01 A minimum of 230 acres of pastures and old fields are maintained through livestock grazing.	NA		
GOAL 45 Manage mineral resources to meet demands for energy and non-energy minerals	Issue rock permits. Recreational gold panning and dredging. 250 permits issued in 2007	Manage dredging use.	Prepare S&G for dredging. Continue issuing common variety mineral permits. To meet demand. Commercial permits for common variety permits will require an approved mining and reclamation plan. Work with BLM if any mining proposals are submitted.

2004 Revised Plan Goals & Objectives	Existing Condition	Opportunities	Possible Management Practices
GOAL 46 Where reserved or outstanding mineral rights are involved, the mineral owner is encourage to implement all surface-disturbing activities outside riparian areas.	Currently working on acquiring outstanding mineral rights on district. Approx. 8-9 areas where FS does not have mineral rights There are seven tracts containing 1,034 acres of outstanding or reserved mineral rights.	Acquire rights Work with mineral owners if activity begins	As surface permits requested apply S&G Seek NFLM funding to establish U.S. ownership of these private mineral rights under the Tennessee Dormant Mineral Statue
GOAL 47 Construct, reconstruct and maintain roads to reduce sediment delivery to water bodies.	See RAP	See RAP	See RAP
GOAL 48 Provide a transportation system that supplies safe and efficient access for forest users while protecting forest resources. Emphasize acquisition of rights-of-way or fee-simple titles as appropriate to facilitate maintenance and meet access needs.	See RAP Currently user conflicts along River Road	See RAP Perform traffic and speed study on TRR to determine options.	See RAP TBD
GOAL 49 Decommission unneeded roads (classified and unclassified).	See RAP	See RAP	See RAP
OBJECTIVE 49.01 Decommission unneeded roads that are identified through interdisciplinary process.	See RAP	See RAP	See RAP
GOAL 50 Identify and upgrade highly used forest roads needed for public access and other roads that are needed but are adversely affecting surrounding resource values and conditions.	See RAP	See RAP	See RAP
OBJECTIVE 50.01 Coordinate funding from sources such as the Public Forest Service Roads Program to perform deferred maintenance activities and upgrade high used roads and needed roads that are adversely affecting surrounding resource values. Where appropriate, seek to transfer jurisdiction and maintenance to counties.	See RAP	See RAP	See RAP
GOAL 51 Construct new NFSR only where allowed by prescription and where existing roads are inadequate to meet the need.	See RAP	See RAP	See RAP
GOAL 52 Utility corridors and communication sites on NFS lands are located and managed to minimize adverse environmental, social, and impacts to scenery; minimize acres of land affected; designed using good engineering and technological practices; and clearly benefit society.	TVA FLEC TDS, BellSouth There are no communication s sites on NF land	Work with utility companies during the screening process on new requests.	Follow RLRMP Standards

2004 Revised Plan Goals & Objectives	Existing Condition	Opportunities	Possible Management Practices
GOAL 53 NFS lands are consolidated to improve management effectiveness and enhance public benefits.	99% ownership in upper Tellico Green cove and pond Numerous tracts in middle Tellico 52% ownership There are nine in holdings & several Pvt. Tracts that NFS surround on three sides. The District has prepared and maintains a Landownership Adjustment map	Pursue willing sellers. Acquire school tract at Johns Creek. Land exchange with Citico Church acquisition. Use LAM to direct people to tracts we are interested in acquiring for possible exchanges.	Deed of green cove pond indicates no trade to USFS permitted. Identify tracts in active exchange plan. Work with Partners (Nature Conservancy) to acquire High priority tracts.
GOAL 54 Boundary lines are located to NFS standards and maintained on a rotational basis.	? miles to standard ? miles need maintained to standard	Maintain lines	Contract/survey
OBJECTIVE 54.01 Boundary lines are to be survey and marked to NFS standard and maintained on an 8-10 year rotational basis.	Boundary lines are marked and surveyed on an as needed basis	Contract survey work and marking if needed	Budget will have to be identified for this work and boundary work placed as a higher priority.
GOAL 55 Resolve all known title claims and encroachments affecting NFS lands.	None known at this time	Document any discovered during landline maintenance and seek funding to resolve.	Seek NFLM funding to maintain landlines on an 8 to 10 year basis.
OBJECTIVE 55.01 Title claims and encroachments affecting lands are to be document prioritized for resolution each fiscal year and resolved within the constraints of the applicable authority.	Known encroachment but documented?	Document encroachments and solve	Document encroachments and solve
GOAL 1.A-1 The Government will seek to acquire private mineral rights through purchase, exchange, or donation. Until such private rights are acquired, the exercise of reserved and outstanding mineral rights to explore and develop mineral resources will be respected.	All mineral rights in USFS See Goal 46.	None	None
GOAL 1.A-2 Pursue the purchase of outstanding or reserved subsurface mineral rights within the A.T., wilderness or roadless areas recommended for wilderness study.	All mineral rights in USFS	None	None

2004 Revised Plan Goals & Objectives	Existing Condition	Opportunities	Possible Management Practices
GOAL 1.A-3 Prevent or mitigate any adverse impacts from air pollutions to the Air Quality Related Values of the Class 1 area, Cohutta and Joyce Kilmer/Slickrock Wilderness through a cooperative working relationship with agencies managing air quality.	NA		
OBJECTIVE 1.A-3.01 Conditions of Air Quality Related Values improve over current adversely affected levels.	NA		
2.B.3 Eligible Recreation River	Tellico River is an eligible river that had a suitability study drafted at one time. Currently RX 7.a, 7b, 7.d and 1.a. RM 30 (steel bridge)-48 (state line)	Determine if and when the forest would pursue initiating a new suitability study.	Coordinate with regional W&SR staff for professional and financial support for the planning effort if desired.
12.B-1 Discourage new utility corridors and communication/electronic sites. Require a landscape management plan with screening, feathering, and other vegetation management techniques to mitigate the visual and other impacts of new, upgraded, or reauthorized utility corridors or communication/electronic sites.	No current proposals Not many high elevation sites in this area.	Where possible have them use existing corridors	During screening for new proposals - steer them toward existing sites.
5.A			
7.A			
7.B			
7.D			
OBJECTIVE 8.B-1.01 Manage forest successional stages to maintain a minimum of 20 percent of forested acres in mid- late-successional forest, including old growth; a minimum of 10 percent of forested acres in late-successional forest, including old growth; and 10 to 17 percent in early-successional forest.	Early 168 Regen 255 Total 423 Mid-Late 4587 Late 3809	Early 386- 952 Mid 1,617 Late 809	Even age and 2 age regen
GOAL 9.F-1 Maintain and restore rare communities found on CNF lands.	USGS report complete on 9.F area. Balds conservation strategy also	Consider recommendations from USGS report and balds conservation strategy	TBD
OBJECTIVE 9.F-1.01 Pursue opportunities to acquire lands to ensure and augment ecological viability of these areas.	Currently all in FS ownership		
OBJECTIVE 9.F-1.02 Based on periodic monitoring of known rare community sites, identify management activities needed to maintain or restore characteristic structure, composition, and function of these communities, and implement an annual program of work designed to meet these needs.	USGS report complete on 9.F area	Consider recommendations from USGS report Develop monitoring plan	Implement monitoring

2004 Revised Plan Goals & Objectives	Existing Condition	Opportunities	Possible Management Practices
OBJECTIVE 9.F-1.03 Develop management plans for 26 known rare community sites (Appendix E).		Develop management plan for Haw Knob	Develop management plan for Haw Knob
OBJECTIVE 9.F-1.04 Restore at least 500 acres of table-mountain pine forest on lands not currently dominated by table-mountain pine over the next ten-year period.	0 acres known at this time	None known	Look for opportunity. Pburn and or regenerate.
OBJECTIVE 9.F-1.05 To maintain table-mountain pine forests, prescribe burn an average of 160 acres of this type each year.	23 acres 32 acres in Gravelstand burn block		Burn
GOAL 9.F-2 Develop implement, and test methods for restoring spruce-fir forest to areas historically occupied by them.	Consider planting Fraser fir, red spruce	Develop proposal for planting in Haw Knob	
GOAL 9.F-3 Cooperate in efforts to minimize adverse effects of acid precipitation and balsam woolly adelgid on spruce-fir communities.	NA		
GOAL 9.F-4 Develop cooperative relationships with private landowners to maintain or establish habitat corridors between patches of spruce-fir habitat.	NA		
OBJECTIVE 9.F-4.01 Maintain all existing acres (642 acres) of montane spruce-fir forest. With the involvement of the Research Branch and other cooperators, consider restoration of up to 100 additional areas of montane spruce-fir forest to areas historically occupied by them, excluding grassy and heath balds.	NA		
OBJECTIVE 9.F-4.02 Develop site-specific management plans for each significant cave to meet the intent of the Federal Cave Resources Protection Act.	No Known caves maybe mine shafts		Determine any caves
OBJECTIVE 9.H-1.01 Manage forest successional stages to maintain a minimum of 50 percent of forested acres in mid- late-successional forest, including old growth; a minimum of 20 percent of forested acres in late-successional forest, including old growth; and 4 to 10 percent in early-successional forest.	Early 2 Mid-Late 219 Late 187	Early 9-25 Mid 135 Late 54	Regenerate
GOAL 11-1 Riparian ecosystems, wetlands and aquatic systems are managed (and where necessary restored) to protect and maintain their soil, water, vegetation, fish and wildlife associated resources.			
OBJECTIVE 11-1.01 Maintain a current inventory of improvement needs for riparian areas and wetlands, Prioritize and implement riparian improvement needs base on watershed analysis and stream condition inventories.		Prepare inventory	
GOAL 11-2 Streams are managed in a manner that results in a minimum of 200 pieces of large woody debris (LWD) per stream mile.	Currently 200	Maintain 200	HWA

2004 Revised Plan Goals & Objectives	Existing Condition	Opportunities	Possible Management Practices
GOAL 11-3 Aquatic habitat conditions are suitable to maintain viable populations of aquatic species native to the planning area, and to support desirable levels of selected species (e.g., species with special habitat needs, TE&S species, species commonly fished, MIS or species of special interest).	1 sp extirpated at state line probably due to sedimentation Other sp showing impacts		Continue to work with NFNC on UT OHV Area Continue monitoring populations
GOAL 11-4 Survey habitats and work with TWRA to re-introduce native aquatic species into suitable habitats.	4 reintroduced populations 5 sp surveys	Continue	Continue surveys and reintroductions
OBJECTIVE MA 3-1.04 In the Tellico River watershed, priority Forest Service Roads to maintain and improve to reduce the movement of accelerate sediment from roads to tributary streams of the Tellico River include 76, 2033, and 36	76 in assessment area not 2033 and 36	See RAP for recommendation to reduce sedimentation	See RAP for recommendation to reduce sedimentation
OBJECTIVE MA 3-1.05 Evaluate the condition of dispersed recreation areas located in riparian areas. Prioritize and implement treatment needs to improve riparian condition and reduce accelerated sediment delivery to streams.	No sites known with concerns	Confirm sites Monitoring to maintain current status.	
OBJECTIVE MA 6-1.02 In the Tellico River watershed, priority Forest Service Roads to maintain and improve to reduce the movement of accelerate sediment from roads to tributary streams of the Tellico River include 384, 126, and 217	384 and 126 in assessment area	See RAP for recommendation to reduce sedimentation	See RAP for recommendation to reduce sedimentation
OBJECTIVE MA 6-1.03 Evaluate the condition of dispersed recreation areas located along the Tellico River, North River, Bald River, Citico Creek and Doublecamp Creek. Prioritize and implement treatment needs to improve riparian condition and reduce accelerated sediment delivery to streams.	Sites along TR addressed in 2004 recreation strategy for Tellico River corridor.	Monitor and improve TR sites to maintain reduced sediment delivery	Develop day use "plan" of corridor management plan. Modify put in and take outs and trailheads.

Cherokee National Forest
Tellico Ranger District

Roads Analysis Report

Middle/Upper Tellico River
Assessment Area

November 2008
Version 1.0

BACKGROUND

In August 1999, the Washington Office of the USDA Forest Service published Miscellaneous Report FS-643 titled Roads Analysis: Informing Decisions about Managing the National Forest Transportation System. The objective of roads analysis is to provide decision makers with critical information to develop road systems that are safe and responsive to public needs and desires, are affordable and efficiently managed, have minimal negative ecological effects on the land, and are in balance with available funding for needed management actions.

In November 2005, the agency published the Transportation Final Rule and Administrative Policy authorizing units to use, as appropriate, the road analysis procedure embodied in FS-643 to assist land managers making major road management decisions.

PROCESS

Roads analysis is a six-step process. The steps are designed to be sequential with the understanding the process may require feedback among steps over time as an analysis matures. The amount of time and effort spent on each step differs by project, based on specific situations and available information. The process provides a set of possible issues and analysis questions for which the answers can inform choices about road system management. Decision makers and analysts determine the relevance of each question, incorporating public participation as deemed necessary.

- Step 1. Setting up the Analysis
- Step 2. Describing the Situation
- Step 3. Identifying Issues
- Step 4. Assessing Benefits, Problems and Risks
- Step 5. Describing Opportunities and Setting Priorities
- Step 6. Reporting

PRODUCTS

The product of an analysis is a report for decision makers and the public that documents the information and analyses used to identify opportunities and set priorities for future national forest road systems. Included in the report is a map displaying the known road system for the analysis area, and the needs and opportunities for each road, or segment of road. A complete list of all the maps is included in Step 6. This report will:

- Identify needed and unneeded roads;
- Identify road-associated environmental and public safety risks;
- Identify site-specific priorities and opportunities for road improvements and decommissioning;
- Identify areas of special sensitivity or any unique resource values.

THIS REPORT

This report documents the roads analysis procedure used for the Middle/Upper Tellico Assessment Area (wherever analysis area is referenced in this document, it corresponds to the Middle/Upper Tellico Assessment Area boundary). This report is a "living" document and reflects the conditions of the analysis area at the time of writing. The document can be updated as the need arises and conditions warrant. Any future updates will be reflected in the title (e.g., version 2.0).

STEP 1. SETTING UP THE ANALYSIS

Purpose and Products

The purposes of this step are to:

- Identify the geographic scale or scales for the analysis,
- Develop a process plan for conducting the analysis, and
- Clarify the roles of technical specialists and line officers in the team.

The products of this step are:

- A statement of the objectives of the analysis,
- A list of interdisciplinary team members and participants,
- A list of information needs, and
- A plan for the analysis.

Objectives of the Analysis

This roads analysis is at the watershed scale; it is being completed for the Middle/Upper Tellico Assessment Area. Unless otherwise stated, the boundary for this roads analysis will match the Middle/Upper Tellico River watershed boundary. (See maps in Attachment A.)

This report analyzes all the roads in the analysis area – including the existing Forest Service system roads, temporary, and unauthorized (see Step 2 for definitions). It will describe opportunities and set priorities; and some of these opportunities will be carried forward in the Middle/Upper Tellico EA.

Interdisciplinary Team Members and Participants

Member	Title	Role for Roads Analysis
Janan Hay	Planning Team Leader	Co-Team Leader
Bob Lewis	Silviculturist	Vegetation
John Lane/Mary Dodson	Wildlife Biologist	Wildlife Habitat/T&E
Jim Herrig	Fisheries Biologist	Fisheries Habitat/T&E
Mark Pistrang	Botanist/Ecologist	Ecology/T&E
Gary Hubbard	Civil Engineer	Co-Team Leader/Forest Engineer

Member	Title	Role for Roads Analysis
Quentin Bass/Chris Bassett	Archeologist	Cultural Resources
Jason Jennings	Hydrologist	Water/Soils
Doug Byerly	Landscape Architect	Recreation
Anita Bailey	GIS Specialist	GIS
Leslie Smith	Other Resource Assistant	Recreation
Dan Herron	Forester	Special Uses
Dave Martin	South Zone FMO	Fire
Rex Kelley	Tellico District FMO	Historical perspective

Information Needs

The data currently housed in the geographic information system (GIS) will be the information used for this analysis. Updates will be made as new information became available. Extensive GIS maps are needed for the various resource fields and are discussed in Step 2 and displayed in Attachment A.

Analysis Plan

Review of the document will occur on the Cherokee NF (Forest Service specialists); and, the report will be available for other Forests as well. Once finalized, the document will be available to the public if requested. It will be part of the administrative record for the Middle/Upper Tellico EA, for much of the information and many of the opportunities identified may be carried forward in the EA. The Middle/Upper Tellico Team conducted the analysis using GIS data, field data, and public involvement. The interdisciplinary (ID) team developed issues related to road management and reviewed all the questions in Step 4 to determine which were applicable to the analysis area. In Step 5 the team brought together all the resource information and made recommendations and set priorities.

STEP 2. DESCRIBING THE SITUATION

Purpose and Products

The purpose of this step is to:

- Describe the existing road system in relation to current forest plan direction.

The products of this step are:

- A map or other descriptions of the existing road and access system defined by the current forest plan or transportation plan, and
- Basic data needed to address roads analysis issues and questions.

Existing Road and Access System Description

Most of the study area is on National Forest System land, and of the roads assessed in and near the boundary of this study area, most are National Forest System Roads (NFSRs) under the jurisdiction and maintenance of the Forest Service. There are approximately 88 miles of Forest Service jurisdiction roads within the analysis area. Approximately 44 miles of the Forest Service roads are closed to motor vehicle use by the public. These roads are gated, vegetated, and closed seasonally or throughout the year. The remaining 44 miles of roads are open to public motor vehicle use. Most of the NFSRs are in fair to good condition, but all have annual routine maintenance needs. Deferred maintenance needs exist for just about all roads.

There are 2.2 miles of unauthorized roads.

There are approximately 18 miles of road under county jurisdiction and approximately 37 miles under state jurisdiction.

Land and Resource Management Plan Emphasis

The Middle/Upper Tellico Assessment Area covers approximately 28,978 acres. This acreage is contained within Management Areas 3 and 6 and is allocated into the following Management Prescriptions:

1.A (3%) - Designated Wilderness (portion of Bald River Gorge Wilderness)
The emphasis is to allow ecological and biological processes to progress naturally with little to no human influence or intervention, except the minimum impacts made by those who seed the wilderness a s a special place offering opportunities to experience solitude and risk in as primitive surrounding as possible.

5.A (<1%) - Administrative Sites (Tellico Ranger District Office)
Sites are managed to serve/support resource programs and will be maintained to protect capital investment.

7.A (11%) - Scenic Byway Corridors (portion of Cherohala Skyway)
Scenic Byway corridors are managed to provide visitors with enjoyment of outstanding scenery of natural and cultural landscapes along a well –maintained road. Management is focused on protecting and showcasing the unique and scenic natural and cultural resources, which were the basis for the corridor being designated a scenic byway.

7.B (31%) - Scenic Corridors/Sensitive Viewsheds (portions of Tellico River corridor)
The emphasis is on providing, through maintenance or restoration and design, high-quality scenery in sensitive recreation and travel way settings.

7.D (<1%) - Concentrated Recreation Zone (campgrounds along Upper Tellico River)
Concentrated recreation zones are managed to provide the public with a variety of recreation opportunities in visually appealing and environmentally healthy settings. Facilities are provided to enhance the quality of the recreational experience and/or to mitigate damage to the affected ecosystems.

8.B (28%) - Early Successional Habitat Emphasis (Middle Tellico general forest lands)
This area emphasizes providing optimal to suitable habitat for a variety of upland games species and plant and animals associated with early successional forest habitats. Management activities are designed to: 1) sustain a distribution of early successional habitat conditions interspersed throughout a forest ed landscape, 2) maintain a habitat structure that provides both horizontal and vertical diversity, 3) optimize hard and soft mast production and 4) control access to protect habitat when necessary.

9.F (3%) - Rare Communities (Haw Knob)
Rare communities are assemblages of plants and animals that occupy a small potion of the landscape, but contribute significantly to plant and animal diversity. Rare communities, are managed to ensure their contribution to meeting goals for community diversity, endangered and threatened species recovery and providing habitat for sensitive and locally rare species.

9.H (<1%) - Restore forest communities to their ecological potential
Manage, maintain, and restore forest communities to those plant communities predicted as most likely to occur in each ecological unit based upon their ecological potential,

11 (18%) - Riparian Corridors: Streams, Lakes, Wetlands, and Floodplains (acreage encompassed in above percentages)

12.B (24%) - Remote Backcountry Recreation – Non-motorized
Recreation opportunities are provided in large remote areas where users can obtain a degree of solitude and the environment can be maintained in a near-natural state. There will be little to no evidence of humans or human activities other than recreation use and non-motorized trails.

Management Areas 3 and 6 contain objectives to reduce the movement of accelerated sediment to Tellico River and its tributaries from roads and riparian recreation areas.

Road Definitions (36 CFR 212.1)

As mentioned above, the Federal Register published the Final Rule and Administrative Policy November 9, 2005; this established new definitions for road management on the National Forests. Listed below are the new definitions relating to roads.

Road - A motor vehicle route over 50 inches wide, unless identified and managed as a trail.

Forest road - A road wholly or partly within or adjacent to and serving the National Forest System that the Forest Service determines is necessary for the protection, administration, and utilization of the National Forest System and the use and development of its resources.

National Forest System road - A forest road other than a road which has been authorized by a legally documented right-of-way held by a State, county or other local public road authority.

Designated road - A National Forest System road, on National Forest System lands that is designated for motor vehicle use pursuant to § 212.51 on a motor vehicle use map.

Motor vehicle use map - A map reflecting designated roads, trails, and areas on an administrative unit or a Ranger District of the National Forest System.

Temporary road – Roads authorized by contract, permit, lease, other written authorization, or emergency operation, not intended to be a part of the forest transportation system and not necessary or long-term resource management.

Unauthorized road – A road that is not a forest road or a temporary road and that is not included in a forest transportation atlas.

Road Decommissioning – Activities that result in the stabilization and restoration of unneeded roads to a more natural state.

Temporary road - A road necessary for emergency operations or authorized by contract, permit, lease, or other written authorization that is not a forest road and that is not included in a forest transportation atlas.

Maintenance - The upkeep of the entire forest transportation facility including surface and shoulders, parking and side areas, structures, and such traffic-control devices as are necessary for its safe and efficient utilization.

Basic Data Needs

Basic data needs are listed below for the Middle/Upper Tellico Roads Analysis; these were data needed to adequately address the issues. Some of the data are displayed in this report, and other data was used to help answer questions in Step 4, but are located on file at the Tellico Ranger District.

- GIS layer of existing road network.
- INFRA Road Database
- GIS layer of linear and spot wildlife openings
- GIS layer of potential unroaded areas
- GIS layer of NNIP
- Classification of all roads by type and level of use, season of use and maintenance needs.
- GIS Layer of RLRMP Management Prescriptions
- Identification of unauthorized roads and garbage dumping sites within the analysis area
- Map of wetlands and streams within the analysis area.
- GIS layer TES species
- The location of roads relative to riparian boundaries and the intersections that influence riparian vegetative communities.
- Wildfire occurrence map
- GIS Layer of Rx burn blocks
- GIS layer of special use permits
- GIS trails layer
- Fish distribution layer and aquatic species database

- Anakeesta location map

STEP 3. IDENTIYING ISSUES

Purpose and Products

The purpose of this step is to:

- Identify the key questions and issues affecting road-related management, and
- Describe the origin of the issues.

The products of this step are:

- A summary of key road-related issues, including their origin and basis, presented by general categories of environmental, socio-cultural and economic, and
- A description of the status of current data, including sources, availability, and methods of obtaining information.

Issue Summary

The following were identified as issues, by the interdisciplinary team, for this roads analysis.

Issue 1 – Private Property/Special Use Access

Private property access and special use permit access are issues in this Road RAP Analysis. They are factors in deciding the management of roads in all Management Prescriptions in the Upper/Middle Tellico Analysis area. Roads they need for access are retained on the road system.

Issue 2 – Use of roads for wildfire suppression and prescribed burning.

Existing system roads serve an important role in safe and efficient wildfire suppression operations. Timely access for suppression personnel and equipment is dependent upon an adequate road system.
Existing roads often serve as the primary control lines. This allows for suppression with minimal ground disturbance and minimal exposure of personnel to hazards. In addition to wildfire suppression, system roads serve as the primary containment sources for the Zone's Hazardous Fuels Reduction.

Issue 3 – Access for Vegetation Management

Generally, the road network in the Middle/Upper Tellico Assessment Area was designed and built to facilitate vegetation management. Access is generally good, but small amounts of roading may be needed for future management.

Issue 4 – Access/Use for Wildlife Management

The presence of roads, especially roads open to public traffic, can have adverse effects on wildlife. Many adverse impacts are the result of disturbance, illegal harvest, and habitat alterations caused by roads. Controlling access, by gating roads, is an important tool for mitigating adverse impacts. Gated roads also provide benefits for wildlife when these areas are managed as linear wildlife openings or provide access to spot openings. Roads also facilitate and provide access for hunting and wildlife viewing opportunities. Maintaining un-roaded areas is crucial in order to provide wildlife with large contiguous blocks of un-fragmented habitat with low levels of disturbance. Controlling access, providing wildlife openings, and maintaining un-roaded areas were identified as important road issues for wildlife in the Middle Tellico Watershed Analysis Area

Issue 5 – Recreation/Heritage Use

Roads are important factor from a recreational standpoint for numerous reasons. They serve as the primary conduit for ingress/egress to the National Forest and the recreation zones. Recreation activities in the Middle Upper Tellico watershed include: horseback riding, fishing, hiking, camping, swimming, hunting, scenic driving, and many others. All of these recreational activities require a road system to access the recreation zones. Additionally from an administrative standpoint, roads are a necessity for emergency response and maintenance of recreational zones and campgrounds.

Status of Current Data

The roads in the analysis area are in the GIS system, and their condition/status is current as of the spring of 2008. The road number, name, length, and other data are listed in Table 1.

Table 1. Middle Upper Tellico River Assessment Area Roads - Current Condition (10/24/2008)

ROAD #	NAME	Mileage in Watershed	Miles of road within 100' of stream	Status (as defined by Travel Management Rule)	SURFACE TYPE	REMARKS
NATIONAL FOREST SYSTEM ROADS						
24	BEAVERDAM BALD	1.93	0.14	Open	Improved native mat.	Barrier to AOP at Big Oak Cove Creek
34	BUCKHORN	0.50	0.07	Open	Gravel & imp.	
34	BUCKHORN	1.01		Closed	Improved native mat.	
35	CITICO CREEK SOUTH	1.28	0.64	Open	Bituminous	
57	CANE CREEK	1.11	0.15	Open	Improved native mat.	
61	SYCAMORE	0.41		Open	Gravel	
76	LYONS CREEK (OLD FURNACE)	0.23		Open	Gravel	
126	BALD RIVER	2.03	0.14	Open	Gravel	
210	TELLICO RIVER	17.79	11.67	Open	Asphalt	
216	NORTH RIVER SHORTCUT	0.67	0.14	Open	Gravel	
217	NORTH RIVER	0.01	0.01	Open	Bituminous & agg.	
341	CONASAUGA CREEK	2.02	0.43	Open	Improved native mat.	
351	THOMAS BOWEN EASEMENT	0.09		Closed	Improved native mat.	
352	OLD CCC CAMP RD.	0.62	0.05	Open	Improved native mat.	
354	MARTIN EASEMENT	0.13		Open	Native mat.	
353	BILLY RIDGE	1.08	0.17	Closed	Native mat.	
355	THOMAS TILLER EASEMENT	0.06		Closed	Gravel	
384	WILDCAT CREEK	2.51	0.14	Open	Aggregate & conc.	
434	TURKEY CR. MTN. ORV	1.21	0.35	Open	Native mat.	
2041	SAWMILL FIRE	1.22	0.11	Closed	Native mat.	60" dia. pipe has water running underneath

ROAD #	NAME	Mileage in Watershed	Miles of road within 100' of stream	Status (as defined by Travel Management Rule)	SURFACE TYPE	REMARKS
2051	OLD HEMLOCK	1.41	0.07	Closed	Gravel	
2051	OLD HEMLOCK	0.28		Closed	Native mat.	
2051	OLD HEMLOCK	1.10		Closed	Native mat.	
2052	LOWER HOBBS HOLE	0.61		Closed	Improved native mat.	
2055	CANEBRAKE RIDGE	1.25	0.02	Closed	Native mat.	
2069	QUARRY CREEK	0.58		Closed	Gravel	
3410	HOG BRANCH	0.25		Closed	Gravel	
4251	COWMIRE	2.31		Closed	Gravel	
4252	HUCKLEBERRY RIDGE	0.00		Closed	Gravel	
4521	TURKEY CREEK KNOB	1.70	0.03	Closed	Improved native mat.	
4522	TURKEY LEAD	0.56		Closed	Improved native mat.	
5023	GREEN COVE CEMETERY	1.18	0.12	Open	Improved native mat.	
40410	FLATS MTN.	0.07		Closed	Native mat.	
40520	CORMIER EASEMENT	0.11		Closed	Gravel	
40530	LAUREL CREEK	0.45	0.01	Closed	Native mat.	
40531	SHAW MTN. SPUR	1.29		Closed	Improved native mat.	
40532	OLD LAUREL RIDGE	0.21		Open	Native mat.	
40533	BUCK POINT	0.26		Closed	Improved native mat.	
40536	PMG EASEMENT	0.07	0.07	Open	Gravel	
40540	BUCK BRANCH	0.96		Closed	Improved native mat.	
40541	CANEY BRANCH	1.95	1.02	Closed	Improved native mat.	Caney Br. crossing: 3- 24" pipes
40542	CANEY RIDGE	1.02	0.03	Open	Improved native mat.	

ROAD #	NAME	Mileage in Watershed	Miles of road within 100' of stream	Status (as defined by Travel Management Rule)	SURFACE TYPE	REMARKS
40543	CANEY RIDGE SPUR	0.26		Open	Improved native mat.	
40550	VAN ASDALE EASEMENT	0.80		Closed	Native mat.	
40551	HENSON MOUNTAIN	1.64		Closed	Improved native mat.	
40561	BIG BRANCH	0.37		Closed	Improved native mat.	
40631	BASIN CREEK	2.37	0.10	Closed	Native mat. & agg..	
40641	NATTY CREEK SPUR	0.03		Closed	Native mat. & agg..	
40680	OLD TN 68	0.10		Closed	Asphalt	
40681	BIG RIDGE	0.81	0.06	Closed	Improved native mat.	
40682	STILLHOUSE CREEK	0.31		Closed	Improved native mat.	
40683	BIG RIDGE SPUR	0.07		Closed	Improved native mat.	
40721	SPIVEY CREEK	0.65	0.01	Closed	Improved native mat.	
40723	PRICE ACCESS	0.21	0.10	Closed	Native mat.	
40724	PHEASANT BRANCH	0.34	0.07	Closed	Native mat.	
40831	PANTHER BRANCH	4.56	0.16	Closed	Gravel	
40832	MAPLE CAMP LEAD	1.64		Closed	Improved native mat.	
40841	SUGAR MOUNTAIN	1.45	0.05	Closed	Improved native mat.	
40892	UPPER SYCAMORE	0.79		Closed	Improved native mat.	
40921	SUGAR MTN. LEAD	0.16		Closed	Gravel	
44091	STEWART BRANCH	0.76		Closed	Gravel	

ROAD #	NAME	Mileage in Watershed	Miles of road within 100' of stream	Status (as defined by Travel Management Rule)	SURFACE TYPE	REMARKS
44092	BOYD FIELD	0.61		Closed	Gravel	
44151	TURKEY CREEK MTN.	0.71		Closed	Improved native mat.	
44161	JOHNS CREEK	0.32		Open	Native mat.	
44171	LOWER WHIGG RIDGE	0.42		Closed	Native mat.	
44251	BELL MOUNTAIN	0.21		Closed	Gravel	
47201	MANGUS BRANCH	0.69		Closed	Native mat.	
404401	SMOKEY RUN	2.54	0.08	Closed	Native mat.	
440903	LULA GAP	0.24		Open	Gravel	
2051A	OLD HEMLOCK SPUR	0.53	0.02	Closed	Improved native mat.	
210A	RANGER STATION & WC.	0.57	0.38	Open	Bituminous	
210B	PHEASANT FIELD	0.42	0.32	Open	Gravel	
210C	BABY FALLS PARKING	0.05	0.10	Open	Gravel	
210D	WALNUT GROVE PARKING	0.04	0.02	Open	Bituminous	
210E	PANTHER BRANCH PARKING	0.04	0.04	Open	Bituminous	
210F	SPIVEY COVE	0.56	0.33	Open	Gravel	
210G	ROUGH RIDGE SPUR	1.70	1.39	Closed	Native mat.	Decommissioned
210H	BIG OAK COVE REC.AREA	0.12	0.08	Seasonal	Gravel	
210J	N. RIVER CHECKING STATION	0.07	0.02	Open	Gravel	
210K	DAM CREEK PICNIC AREA	0.01	0.01	Open	Bituminous	
210L	SOURWOOD CAMPGROUND	0.20	0.05	Open	Native mat.	
210N	OLD CABIN SPECIAL USE	0.18		Closed	Native mat.	No closure device
210P	OLD CABIN	0.08		Closed	Native mat.	No closure device
210R	PHEASANT FIELD PARKING	0.03		Open	Bituminous	
210T	DAVIS BR. CAMPGROUND	0.02		Open	Gravel	
210U	OOSTERNECK PARKING	0.04		Open	Bituminous	TDOT Jurisdiction
210Y	BALLARD SPECIAL USE	0.10		Closed	Native mat.	
2417B	DEEP GAP	0.35	0.05	Closed	Gravel	
341B	CONASAUGA SPUR B	0.25		Closed	Native mat.	

ROAD #	NAME	Mileage in Watershed	Miles of road within 100' of stream	Status (as defined by Travel Management Rule)	SURFACE TYPE	REMARKS
34A	BUCKHORN SPUR	0.00		Closed	Native mat.	Outside boundary
34B	BUCKHORN SPUR B	1.15	0.17	Closed	Improved native mat.	
352A	OLD CAMP SPUR	0.10	0.03	Open	Improved native mat.	
384A	DOC GADDIS SPEC.USE	0.37		Open	Improved native mat.	
384B	JOHNS CR.SPECIAL USE	0.60	0.12	Closed	Improved native mat.	
384C	MILLER CEMETERY	1.43	0.07	Open	Gravel	
384E	CHUMNEY EASEMENT	0.13		Closed	Gravel	
4251A	COWMIRE SPUR	0.03		Closed	Improved native mat.	
434A	TURKEY CREEK ORV EXTENSION	0.35	0.04	Open	Native mat.	
61B	WHIGG MEADOW-MUD GAP	0.66		Open	Gravel	
61B	WHIGG MEADOW-MUD GAP	0.68		Seasonal	Native mat.	
61C	OLD SYCAMORE	0.14	0.11	Closed	Improved native mat.	
	TOTAL	**87.59**	**19.56**			
UNAUTHORIZED ROADS						
N.A.	off #35; North of #40530	0.03	0.03	Closed	Native mat.	
(40535)	Wiggs Easement (off CH514)	0.27		Closed	Improved native mat.	should be added to system
(40501)	Road to Helispot (off TN165)	0.06		Closed	Native mat.	
N.A.	connects #40723 & #40724	0.51	0.02	Closed	Native mat.	
(40552)	McDaniel Easement(off CH513)	0.02	0.03	Closed	Improved native mat.	should be added to system
N.A.	off #40531	0.05		Closed	Native mat.	
N.A.	off #40532	0.14		Closed	Native mat.	

ROAD #	NAME	Mileage in Watershed	Miles of road within 100' of stream	Status (as defined by Travel Management Rule)	SURFACE TYPE	REMARKS
N.A.	along Caney Br Ridge	0.99		Closed	Native mat.	
(40842)	Strunk Easement (off #40724)	0.09	0.04	Closed	Improved native mat.	should be added to system
	TOTAL	**2.16**	**0.12**			
COUNTY ROADS						
CH510	**POPLAR BLUFF**	**0.88**	**0.52**		**Gravel & Bituminous**	
CH512	RAFTER FH407	9.70	1.85		Gravel & Bituminous	
CH514	OLD MILLER RIDGE	0.56	0.11		Gravel & Bituminous	
CH515	SHAW MTN.	1.04			Gravel & Bituminous	
CH522	OLD HEMLOCK	0.41	0.04		Gravel & Bituminous	
CH525	TURKEY CR/CITICO	4.64	1.32		Gravel & Bituminous	
CH525-1	TURKEY CREEK RAMP	0.08	0.02		Gravel & Bituminous	
CH534	WAUCHEESI SPUR	0.25	0.04		Gravel & Bituminous	
	TOTAL	**17.56**	**3.90**			
STATE ROADS						
TN165	TELLICO ROBBINSVILLE ROAD	24.01	2.53		Asphalt	
TN68	STATE 68/FH402	12.98	0.21		Asphalt	
	TOTAL	**36.99**	**2.74**			
	TOTAL ALL ROADS	**146.46**	**26.44**			

STEP 4. ASSESSING BENEFITS, PROBLEMS, AND RISK

Purpose and Products

The purpose of this step is to:

- Assess the various benefits, problems, and risks of the current road system and whether the objectives of Forest Service policy and forest plans are being met.

The products of this step are:

- A synthesis of the benefits, problems, and risks of the current road system,
- An assessment of the risks and benefits of entering any unroaded areas, and
- An assessment of the ability of the road system to meet management objectives.

Current Road System Benefits, Problems, and Risks

The following section is a series of questions and answers that assess benefits, problems, and risks of the current road system and its ability to meet the objectives stated in the Forest Land Management Plan. The questions are from Forest Service publication FS-643, *Road Analysis: Informing Decisions About Managing the National Forest Transportation System*.

Ecosystem Functions and Processes (EF)

EF (1): What ecological attributes, particularly those unique to the region, would be affected by roading of currently unroaded areas?

Large tracts of unroaded land occur in the southeastern portion of the Upper Tellico watershed. These areas include some of the boulderfield forest rare community type and are the most likely areas to have stands reaching old growth conditions in the near future.

EF (2): 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?

Roads are known vectors for the spread of exotic species. Effects are the same across the forest.

EF (3): To what degree do the presence, type, and location of roads contribute to the control of insects, diseases, and parasites?

Addressed in Forest Wide RAP

EF (4): How does the road system affect ecological disturbance regimes in the area?

Roads provide corridors for the movement of both animals and plant species and serve as fire breaks. The lower concentration of roads in the south eastern portion of the Upper

Tellico watershed likely reduces the amount of ecological disturbance in that area as compared to the rest of the watershed.

EF (5): What are the adverse effects of noise caused by developing, using, and maintaining roads?

Noise associated with development, maintenance, and utilization of roads may have adverse effects on wildlife. These adverse effects are influenced by the intensity and duration of the disturbance. Adverse effects vary from short-term behavioral avoidance of an area to long-term changes in species ecology (e.g., permanent changes in home range or reproductive success). Short-term behavioral avoidance of an area is usually associated with routine maintenance and use of most Forest roads. Long-term detrimental impacts are usually associated with new road construction into relatively un-roaded areas or along County, State, or Forest roads with heavy levels of traffic use. Road density and utilization has not varied substantially in the Upper Tellico Watershed Assessment Area during the recent past; therefore, wildlife use has likely habituated to road noise in this area.

Aquatic, Riparian Zone, and Water Quality (AQ)

AQ (1): How and where does the road system modify the surface and subsurface hydrology of the area?

In general, precipitation is intercepted by the road surface and cutbanks. Surface and subsurface flows are also intercepted by the road when water is moving down adjacent hillslopes. Water can be concentrated either on the road surface or in adjacent ditches, and in places, is rerouted from pathways it would otherwise take if the road were not present. By intercepting surface and subsurface water flow, and diverting it into ditches and channels, roads effectively increase the density of streams on the landscape. As a result, water infiltration decreases, the timing of flood flows is quickened, and the peak of flood flows is increased. The magnitude of this effect is dependent on the density of roads, gradient of road, and its location in the watershed. There are approximately 143 miles of Forest Service jurisdiction roads within the analysis area. This represents a road density of 2.1 miles of Forest Service road per square mile of watershed within the analysis area. Approximately 47 miles of the Forest Service Roads are gated, vegetated, and/or closed seasonally or throughout the year. Within this analysis area, Forest Roads (FR) 210, CH512, 210G, CH525, 40541, and approximately 3 miles of TN 165 are most significant in terms of their length, proximity to stream, and potential influence on surface and subsurface hydrology. FR 210 and TN 165 are located adjacent to Tellico over much of its length. FR 40541 is located adjacent or in close proximity to Caney Branch for much of its length. FR 210G is located adjacent to Ruff Ridge Creek. County roads CH512 and CH525 are located adjacent to or in close proximity to Barum Creek and Turkey Creek. Other roads within the analysis area are basically ridge-top/upper side-slope road locations with reduced connectivity to surface and subsurface water. Most of these roads are outsloped with dips and culverts providing drainage or insloped with ditches and cross drains providing water drainage.

Recommendation – Surface drainage can be improved by additional aggregate surfacing, additional drainage dips, cross drain culverts, berms and outsloping. Wing ditches and/or turnouts should disperse water across an undisturbed soil surface. Ditch lines should not lead directly into streams. These mitigation measures can reduce the impacts associated with the roads, including effects to surface and subsurface hydrology and erosion/sediment rates.

AQ (2): How and where does the road system generate surface erosion?

By their nature, all native and aggregate surfaced roads will generate some surface erosion. The amount depends on factors such as soil type, road surface type, road gradient, road prism, the spacing and effectiveness of drainage structures, traffic use, and maintenance activity. The extent of surface erosion occurring on road cutbanks depends on the steepness, slope length, soil type, and vegetative cover. Road ditches concentrate water flow which generates surface erosion and also increase sediment delivery to streams from road surfaces and road cutbanks. Ditches and culverts that are blocked create surface erosion issues by diverting water flow onto road surfaces. Approximately 34 percent of the Forest Service road mileage within this analysis area is closed to all but administrative traffic. These roads are generally vegetated with a grass-wildlife mixture and serve as linear wildlife openings. As a result, surface erosion is minimized from these roads. Roads open to public use provide a continual opportunity for surface erosion, but effective mitigation described in AQ1 will limit surface erosion. Any road opened and used for commercial use (such as logging traffic), would result in an increased potential for surface erosion, but reconstruction or maintenance activities associated with this kind of use would mitigate erosion during use and result in a road with less erosion potential after its use. Surface erosion would also be a concern on any newly constructed permanent or temporary road until the road is closed and re-vegetated or otherwise stabilized with mitigation measures.

There is evidence of minor surface erosion occurring on all the roads that were visited. Evidence of erosion was found on road cutbanks, in ditches, and in stream channels. An excessive amount of erosion is occurring along FR 216.

AQ (3): How and where does the road system affect mass wasting?

There were no active mass wasting sites observed within the analysis area.

Small slides and slumps are possible below culvert outfalls, along fill slopes where road drainage is concentrated, and on road cutbanks. Inadequate sized culverts or plugged culverts may blowout during high flow periods and initiate soil slides. Proper sizing and location of drainage culverts can reduce this potential, as well as, armoring the outfall areas associated with drainage structures, as needed. Road cutbanks propose a problem in steep areas where soils are coarse in texture, shallow, and where unstable colluvium material occurs.

AQ (4): How and where do road-stream crossings influence local stream channels and water quality?

Road-stream crossings serve as a primary conduit for road-related erosion and storm drainage to reach streams. Accelerated sediment delivery to affected streams occurs at these points, and can affect water quality and substrate condition. In most cases culverts have more of an influence on stream channels and water quality than do bridges or bottomless culverts. Culverts concentrate and accelerate water flow causing soil displacement to occur at the outfalls and cause stream banks to undercut. Over time the stream channel adjusts to the change in flow by becoming deeper and/or wider for a short distance below the culvert. Piping occurring under or around culverts is usually a minor source of sediment; however, high sediment loading can occur from a culvert blowout due to piping. Blowouts can also occur from plugged culverts. Road surfacing, eroded materials and pollutants are usually deposited into steams by ditches that empty directly into streams at road-stream crossings.

There are an unestimated number of ephemeral and intermittent drainage crossings within the analysis area. During field surveys there were 43 perennial stream crossings observed along the road system in this project area; 17 are bridges, and 22 are culverts; and 4 are fords. Ditch lines from Wildcat Creek Road lead directly into Tellico River. Other ditch lines that lead directly into stream channels at crossings have been noted in this area.

Recommendations- Create ditch turnouts so that ditch lines do not empty directly into stream channel, repair or replace culverts that are not functioning properly.

AQ (5): How and where does the road system create potential for pollutants, such as chemical spills, oils, deicing salts, or herbicides, to enter surface waters?

Due to the nature and location of the roads within this analysis area, there is little potential for chemical pollution of streams related to Forest Service roads. If roads were used to transport chemicals such as herbicide, the greatest potential for spills affecting aquatic resources would be at stream crossings or road segments located adjacent to streams. FR 210 and 2.5 miles of TN 165 create the greatest potential for pollutants to enter the Tellico River. These roads are heavily traveled by recreationist with campers and OHVs. A variety of chemicals, oil, fuel, and raw sewage are potential water pollutants carried on these vehicles. Due to there impervious nature paved roads have the potential to deliver more pollutants such as oils and deicing salts. Most of the roads in this analysis area are located on ridgetops or upper/middle sideslope locations. Where these roads cross streams, there would be some potential for chemical pollution should a chemical spill occur. Tennessee State Highway 165 also creates potential for pollutants from chemical spills and deicing salts to enter surface waters in the Watershed.

AQ (6): How and where is the road system "hydrologically connected" to the stream system? How do the connections affect water quality and quantity (such as the delivery of sediments and chemicals, thermal increases, elevated peak flows)?

The road system in the analysis area is connected to streams primarily at stream crossings. Generally, the hydrologic connection is made where ditchlines empty into streams or drainages. Road surfacing and other eroded materials are usually deposited into steams by ditches that empty directly into streams. Without proper ditch turnouts, surface runoff enters the stream channel carrying eroded materials and pollutants. If this water moves directly to stream channels, peakflows and hydrograph timing can be somewhat altered from the condition associated with an unroaded watershed. The majority of road mileage within this analysis area is located along ridge-tops or upper/middle side-slopes. However, stream crossings can also be problematic with these roads. Hydrologic connectivity is generally reduced when roads are properly located.

See AQ (4) about crossing where ditch lines empty directly into streams.

Recommendations- - Create ditch turnouts so that ditchlines do not empty directly into stream channel. Determine roads where ditchlines may be eliminated and other types of water control structures such as coweeta dips may be use.

AQ (7): 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?

The use classification for Tellico River is "Domestic Water Supply", "Fish and Aquatic Life", "Recreation" and "Trout Stream". Downstream, the use classification of the Little Tennessee River is "industrial water supply" and "domestic water supply". Little change in use and demand within the analysis area is expected in the near future. Excessive sediment delivery from roads or the Upper Tellico OHV area in NC would have the potential to adversely affect fish and other aquatic organisms by reducing the quality of habitat. The uses of "Domestic Water Supply" and "Recreation" could be affected by the level of turbidity after periods of heavy rain fall. Fish or other aquatic organism passage is discussed in AQ (10). Also see AQ (5) about pollutants from the road system.

AQ (8): How and where does the road system affect wetlands?

Road systems may affect wetland hydrology by altering surface and subsurface drainage patterns. This change has the potential to modify the wetland moisture regime. Roads crossing at wetlands may restrict natural water flow quantity, timing, and routing. There are no known wetland areas within the analysis area.

AQ (9): 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 system can alter physical channel dynamics by increasing runoff and sediment delivery to affected streams. Sediment entering streams can reduce pool depths and contribute to changes in channel substrate (i.e. embededness). Stream crossings can retard or prohibit the movement of large woody debris, fine organic matter, and sediment.

Refer to AQ (4) for stream crossings. Within this analysis area, Forest Roads (FR) 210, CH512, 210G, CH525, FR 40541, and approximately 3 miles of TN 165 have at least one mile of road located within 100' of Tellico River, Caney Branch, Ruff Ridge Creek, Barum Creek and Turkey Creek. In general, floodplain isolation and channel migration impediment resulting from road location is not a concern within this analysis area.

Recommendation – Determine road crossings where culverts could be replaced by bridges or bottomless culverts.

AQ (10): How and where does the road system restrict the migration and movement of aquatic organisms? What aquatic species (i.e. fish and amphibians) are affected and to what extent?

Restrictions to migration for aquatic species primarily occur at stream crossings. There are 43 perennial stream crossings along the road system in this project area; 17 are bridges, and 22 are culverts; and 4 are fords. Seventeen of the culverts are potential barriers to fish, amphibians, or macroinvertebrates; all are administered by the Forest.

Thirty-one of sixty-six stream reaches capable of supporting fish in the analysis area have been surveyed. The unsurveyed stream reaches are unlikely to support any new or rare species.

Fifty-four species of fish have been documented in these streams including: two endangered (experimental populations); two threatened (experimental populations); two sensitive; and one locally rare fish.

The seventeen culverts administered by the Forest Service are not migration barriers for the endangered, threatened, sensitive or locally rare species because these species normally do not occurs in steep gradient channels. The culverts could pose migration barriers to creek chubs, and western blacknose dace. These are among the most common fish species on this forest and do not warrant the cost of culvert replacement to expand their ranges a few hundred feet.

AQ (11): How does the road system affect shading, litterfall, and riparian plant communities?

Of the 197 miles of roads in this project area, 26 (13%) are within the riparian corridor; 23 of which are administered by the Forest Service. Shading, litterfall and riparian plant communities are minimally impacted by these roads because the canopy remains closed. Six road segments contribute sediment to the watershed and are of no apparent use:

No.	Name	Miles
2041	Sawmill Fire	1.22
2051	Old Hemlock	1.00 (approximate)
40533	Buck Point	0.26
40892	Upper Sycamore	0.79
44151	Turkey Creek Mtn.	0.71
210G	Rough Ridge Spur	1.70

Recommendation – Decommission approximately 5.68 miles of roads listed above

AQ (12): How and where does the road system contribute to fishing, poaching, or direct habitat loss for at-risk species?

Fishing and poaching could occur for spotted, largemouth, smallmouth and rock bass, brook, rainbow and brown trout, green sunfish, and bluegill in this analysis area. The "at-risk" species (TESLR) are not subject to fishing or poaching. Direct habitat loss from the road system is unlikely because the riparian corridor will be protected.

Recommendation – Protect the riparian corridor.

AQ (13): How and where does the road system facilitate the introduction of non-native aquatic species?

Addressed in Forest Wide RAP

AQ (14): 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?

Tellico River has 42 species of fish at its lower end; Lyons Creek supports 24; Wildcat Creek has 18; and Turkey Creek has 12. All of the TESLR fish species are located in the lower Tellico River except two populations of Tennessee dace (Sensitive) which occurs in Smoky Run and Oosterneck Creek. The close proximity of the Tellico River road to the Tellico River could pose a threat from an accidental chemical spill.

Terrestrial Wildlife (TW)

TW (1): What are the direct effects of the road system on terrestrial species habitat?

The Forest road system and human use of roads has altered and continues to alter terrestrial species habitat. Direct effects include habitat conversions and fragmentation. These effects are generally adverse and ubiquitous across the Forest and are addressed in the CNF Forest Wide Roads Analysis (Dec. 2002). Specifically, in the Upper Tellico Watershed Assessment Area, gated roads which are utilized as linear wildlife openings and/or access spot wildlife openings (especially those that have been daylighted) provide beneficial effects for many terrestrial wildlife. These roads provide early successional habitat, which is required by many species including turkeys, white-tailed deer, ruffed grouse, and many song birds and other wildlife. Since early successional habitat is a limiting factor in this assessment area, these roads provide an important habitat component.

TW (2): How does the road system facilitate human activities that affect habitat?

Addressed in Forest Wide RAP

TW (3): How does the road system affect legal and illegal human activities (including trapping, hunting, poaching, harassment, road kill, or illegal kill levels)? What are the effects on wildlife species?

Addressed in Forest Wide RAP

TW (4): How does the road system directly affect unique communities or special features in the area?

Road access to Whigg Meadow has increased the amount of non-native species in the area. Despite the use of gates and other closure mechanisms, some illegal vehicular use occurs on the bald.

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?

See table 3 for maintenance costs for each road.

COSTS/REVENUES

Direct costs to the agency include road maintenance costs due to motor vehicle use and any needed restoration or protection costs to stabilize roads near resources such as streams.

Road maintenance costs fit into two categories:

- **Annual Maintenance**. Work performed to maintain serviceability, or repair failures during the year in which they occur. Includes preventive and/or cyclic maintenance performed in the year in which it is scheduled to occur. Unscheduled or catastrophic failures of components or assets may need to be repaired as a part of annual maintenance.

  This amount will vary depending on the road's operational maintenance level which is the maintenance level currently assigned to a road considering today's needs, road condition, budget constraints, and environmental concerns. It defines the level to which the road is currently being maintained.

- **Deferred Maintenance**. Maintenance that was not performed when it should have been or when it was scheduled and which, therefore, was put off or delayed for a future period. When allowed to accumulate without limits or consideration of useful life, deferred maintenance leads to deterioration of performance, increased costs to repair, and decrease in asset value. Deferred maintenance needs

may be categorized as critical or noncritical at any point in time. Continued deferral of noncritical maintenance will normally result in an increase in critical deferred maintenance.

A critical need is a requirement that addresses a serious threat to public health or safety, a natural resource, or the ability to carry out the mission of the organization.

The objective maintenance level is the maintenance level to be assigned at a future date considering future road management objectives, traffic needs, budget constraints, and environmental concerns. The objective maintenance level may be the same as, or higher or lower than, the operational maintenance level.

The operational maintenance level is the maintenance level currently assigned to a road considering today's needs, road condition, budget constraints, and environmental concerns. It defines the level to which the road is currently being maintained.

Expenditures have decreased due to decreased funding. It is hard to predict future funding, but the trend in recent years is a decrease in road maintenance funding.

The need to provide forest visitors with safe and environmentally friendly roads seems to have become an important issue to many legislators. This concern may reverse the recent downward trend.

When funding is below the amount needed, priorities are set concerning which roads will have which maintenance activities (grading, brushing, gravel, etc.) performed.

All the maintenance level 3 roads in the area are graded twice a year and mowed once every two years.

Consideration is given to changing the objective maintenance level if a reduction in funds continues, e.g. maintenance level 3 (suitable for passenger car) is changed to maintenance level 2 (high clearance vehicles). Also, funds other than those specifically designated for road maintenance (CMRD) are often available for road maintenance. These include K-V Trust Fund - Special Legislation (CWK2), 10% Roads and Trails for States Fund (TRTR), Vegetation Management (NFVW), Wildlife Management (NFWF), Recreation Fee Revenue Program (FDFD), road maintenance deposits from timber purchasers, road permits that require the user to perform maintenance, and road legacy funds.

The road system provides for potential revenues to the agency in the following ways:

- Timber sales
- Recreation use fees
- Fees for special use and road use permits:
    - Access to timber on private land

Presently, direct costs exceed direct revenues, but many resource management targets could not be met or would cost more to accomplish without the current road system, so reducing the number of roads and/or reducing the amount of maintenance on roads could result in a net decrease in revenue. For example, roads that provide access to areas for prescribed burns which are needed to reduce hazardous fuels.

CHANGES

Changes to the road system that could increase net revenue:

- Manage the suitable timber base that can be accessed by existing roads and/or new roads that are low cost and would not harm resources. Any new roads would likely have an objective maintenance level of 1 or 2 which reduce the long-term funding needs. New roads would be built to reduce annual maintenance costs. This would be done by the construction features including broad-based dips and the stabilization of the roadbed with gravel or vegetation. Some of the costs associated with this include planning, design, and contract administration. The forest would collect road maintenance deposits from the purchasers and/or the purchaser would perform the necessary maintenance on roads not open the public. It could also provide an opportunity to perform deferred maintenance work on roads open to the public if the work is also needed to accommodate log trucks. Such work would be done so that long-term impacts of a road to adjacent resources are reduced.

- Close roads to motor vehicle use by the public. This could require the following costs: planning, enforcement, and mitigating unacceptable environmental effects such as sedimentation from roads adjacent to streams. Possible consequences of closure: decreases in revenues from commodities such as timber (if road is no longer used to access timber), recreation fees, and other services such as special-use permits. Reduced maintenance costs and reductions in costs to mitigate unacceptable environmental effects would likely increase in net revenues. Some roads were built prior to FS ownership and were considered “public” access with an established historical use. Changes that prevent the public from using roads that have feel they have a “right” to use could increase costs to the agency due to the need for enforcement of the closure and an increase in the amount of time spent responding to complaints.

- Decommissioning is the demolition, dismantling, removal, obliteration and/or disposal of a deteriorated or otherwise unneeded road, including necessary cleanup work. Decommissiong would be done so that the road no longer needs maintenance. Costs include planning, monitoring, repairing or mitigating any unacceptable impacts to resources, and the actual decommissioning work. Possible consequences include decreases in revenues from commodities such as timber, recreation fees, and other services such as special-use permits. This work would reduce maintenance costs and reduce costs to mitigate any unacceptable

impacts to resources. This work could make some areas harder to access for resource management which could increase costs.

- Encourage individuals who use Forest Service roads to access private land to form homeowner associations and/or to approach the county road department to maintain those roads. This would reduce the agency's road maintenance costs. Except for one or two rare situations in other areas of the forest, the Polk County road department has indicated that it is not interested in maintaining any roads that are currently being maintained by the Forest Service.

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

The management of the road system involves decisions to build new roads, reconstruct roads, perform maintenance on some roads and not others, decommission roads, or temporarily close them if they are no longer needed or are causing resource damage.

Construction of new roads, although improving access to the area (a benefit to some), may diminish the desired natural and remote character associated with the area and would reduce its passive use value to some visitors.

Passive use values include features society values simply because they exist without actually using them or they expect them to be preserved for others to use and enjoy (a scenic landscape, wilderness, or an endangered plat or animal). They are also features valued for preservation (cultural resources and historic sites).

Decommissioning and/or closing roads may be necessary to meet budget and funding constraints or to prevent resource damage, but may diminish access to areas that are important to certain users of forest resources. People with a strong attachment to a place, activity, or road may consider it a loss in value unless they are willing and able to find, and adapt, to substitute experiences.

The road users that contribute the most significant economic benefits are those who visit the area for recreation-related activities such as:

Driving for pleasure:
Roads #210, #216, #216, #384, #384C, #126, and #35 are part of a network of roads that is very popular with sightseers.

Camping:
Roads #210, #216, #126, and #24 provide access to numerous developed and dispersed camping areas.

Hunting:
The open roads provide access and closed roads make game retrieval easier.

Fishing:

- Road #210 provides access to Tellico River, North River, Green Cove Pond, and Bald River
- Road #216 provides access to North River
- Road #126 provides access to Bald River and Green Cove Pond
- Road #5023 provides access to Green Cove Pond

Hiking:

Roads #210, #40832, #126, #384, & #384C provide access to trails, #162, #107, #173, #161, & #136, and foot travel is permitted on many roads closed to motor vehicle use.

Wildlife viewing:

The open roads are used by visitors for this activity.

Hiking in wilderness areas:

Roads #210, #384, & #126 provide access to trails in the Bald River Gorge Wilderness.

Visiting historical sites/areas:

Roads #210, #210A, and #210F access CCC camps and CCC structures.

Other:

- Roads #210, #210B, and #61C are used to access a state fish hatchery.

- These roads are used by TVA and Fort Loudoun Electric Cooperative to access power lines: #34, #61C, #210, #210F, #210N, #210P, #210Y, #216, #341, #351, #352, #354, #355, #434, #531, #40541, #40721, #40723, #2069, #40724, and #47201.
  There is an unauthorized road that connects #40723 and #40724 that is used by Ft. Loudoun Elec. that needs to be added to the transportation system.

- These roads are used to access recreation residences: #61C, #210, #210B, #210N, #210P, and #210Y.
  There is an unauthorized road that accesses the Strunk rec. residence off of #40724 that needs to be added to the transportation system.

- These roads provide access to private property: #210, #126, #24, #352, #352A, #354, #384, #384A, #384B, #384C, #384E, #40531, #40532, #40550, #434A, #440903, #44161, #44251, #5023, #57, #351, #355, #40520, #40536, and #40541
  The following unauthorized roads provide access to private property and need to be added to the transportation system:
  - Wiggs Easement (off of CH514)

- McDaniel Easement (off of CH513)

- Road #44251 is used to access the Hardshell Church.

- Roads #384 and #384C are used to access Miller Cemetery, and roads #210, #126, and #5023 are used to access Green Cove Cemetery.

Portions of roads #210, #216, #126, #57, #40631, #44161, #35, #352 and #353 are in riparian areas which could be considered a net cost to society because of the roads impact on water quality.

Based on the activities that the road system accommodates, the following consequences are realized:

Priced:

- Sale of commodities such as timber (on Forest Service and private land)
- Less cost due to convenient access for research, inventory, and monitoring
- Road development and maintenance
- Liability
- Maintenance of trails and recreation-related sites
- Fire suppression
- Resource management
- Control of invasive species
- Mitigation of resource damage from roads

Non-priced:

- Resource protection such as fire suppression, wildlife and watershed management to preserve the "passive" value that the public assigns to natural resources.
- Access to public land and its resources
- Noise and air pollution
- Water quality
- Fish habitat
- Effect of road density on wildlife
- Litter

Typically, the road system increases the value of both priced and non-priced commodities, because without access these items have less value or cost more to obtain. The most notable exception to this is commodities that have an intrinsic value because they are difficult to access, such as a wilderness or areas with low road densities.

The type of experience society desires in the study area and its associated value depends in large part on whether or not there are roads, their density, their condition, and whether or not they are open to motor vehicle use. The consequence may be a net benefit or a cost depending on what value the public assigns to the type of experience they desire.

Road management activities that benefit some members of society by enhancing their quality of life, may negatively impact resources that other members value for their quality of life. These may include impacts to resources such as soil, water, habitat, scenic beauty, or a reduction in value that people assign to an area such as limited accessibility or solitude. Public input is needed to provide information to evaluate the tradeoffs being considered and will help assign "value" to non-priced consequences.

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

The accessibility to resources in the study area is important to the local economy, and commerce associated with forest visitors also has an economic influence on Loudon, Blount, McMinn, and Monroe Counties and the communities of Etowah, Athens, Madisonville, Vonore, Sweetwater, and Tellico Plains. Since counties do not collect property taxes on federal land, activities that generate other tax revenue such as sales tax are beneficial to the community.

Forest roads are the primary means of access to forest resources. Changes to the road system and/or in road management can affect long-established access and use patterns, lifestyles, recreation activities, forest resource-related businesses, the collection of forest products, fire suppression, and the distribution of recreational opportunities available to users. These effects can change the distribution benefits and costs for all users.

Construction, maintenance, or decommissioning of roads in the area is not likely to have a significant long-term impact on the economic benefits derived from recreation activities unless there is a significant reduction in the total mileage of roads that provide access for this use.

The road system distributes the following economic benefits to businesses of various sizes as well as individuals:

- Income from the sale of gas, food, lodging, supplies, and souvenirs.
- Employment under Government contracts for:
  - road maintenance
  - control of invasive species
  - maintenance of wildlife openings
  - vegetation management
  - trail maintenance
  - watershed management
  - fire suppression
  - maintenance of recreation sites

The road system creates different benefits and costs to people who use vehicles for travel within the area than to visitors who travel on foot or by other non-motorized methods. For those who choose non-motorized forms of transportation, the economics of the road system may cost more in terms of aesthetic values, air and noise pollution, and conflicts with motorized vehicle use.

Reduced road mileage and/or maintenance can lead to unbalanced recreation opportunities among users and directly affect the distribution of economic benefits and costs to the region. Closing roads would limit or eliminate access to those who are unable or unwilling to walk long distances and could increase the cost of resource removal, which usually requires mechanized equipment. This could have economic impacts for the local communities, which may depend on convenient access for employment opportunities.

In contrast, improved road access can increase the efficiency and effectiveness of fire-suppression activities, but can also contribute to an increase in the number of human-caused fires in the area. Closing or restricting roads to minimize traffic could be a benefit by reducing fires and keeping the road in a condition that facilitates use by fire fighting equipment.

State and county roads between communities affect how the benefits and costs associated with use of the area are distributed beyond the immediate communities. Forest Service roads #210, #35, #57, #35-1, #384, and #76 are part of a road network that includes the state and county road systems.

As stated in EC (2), the type of experiences and their associated values are dependent upon whether or not there are roads, how the roads are managed, and the desires of the user groups or individual. This may be a benefit or a cost depending on what value the public assigns to the type of experience they desire.

Commodity Production - Timber management (TM)

TM (1): How does road spacing and location affect logging system feasibility?

The spacing and location of existing roads were chosen to accommodate ground based logging systems and tandem trucks. Much of the road system would need to be improved to accommodate tractor trailers for hauling. There may be opportunity for nonground based logging systems in this watershed.

***TM (2) & TM (3): 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*?**

A large portion of the Middle and Upper Tellico Watershed Assessment Area (approximately 20,864 acres) is made up management prescriptions 1A, 5A, 7A, 7B, 7D, 9F, 11 and 12B. These areas are not suitable for timber management or road building.

The suitable land base (approximately 8,114 acres) in the assessment area is made up of management prescriptions 8B and 9H. Road access is generally good for most of the area. Approximately 782 acres are at a distance greater than ¼ mile from an existing

system road and approximately 3 acres are at a distance of greater than ½ mile of a system road. Some additional roading may be needed to gain access to some of the area.

Commodity Production - Minerals Management (MM)

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

Addressed in Forest Wide RAP

Commodity Production - Range Management (RM)

RM (1): How does the road system affect access to range allotments?

N/A. No range allotments.

Commodity Production - Water Production (WP)

WP (1): How does the road system affect access, constructing, maintaining, monitoring, and operating water diversions, impoundments, and distribution canals or pipes?

The only water diversion in this watershed is at the Tennessee State Fish Hatchery on Sycamore Creek. Access is provided for the hatchery**.**

WP (2): How does road development and use affect water quality in municipal watersheds?

See questions AQ (4), AQ (5), and AQ (7) in previous section, about how roads in the Tellico Watershed may affect water quality for municipal water source.

WP (3): How does the road system affect access to hydroelectric power generation?

There are no hydroelectric power generation dams within this analysis area.

Commodity Production - Special Forest Products (SP)

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

Roads in the south eastern portion of the watershed are used in particular to access sites for the collection of ramps. Other than that effects are probably similar here as they are across the forest.

Special-Use Permits (SU)

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

One TVA Transmission line crosses the analysis area. The Hiwassee – Alcoa Transmission line crosses along State Route 68 on Tellico Mountain. Road access to this transmission line is critical to perform periodic maintenance. Access to the line is by NFSR's 341 and 2069. Working with TVA to identify any additional roads they use to access this line.

Fort Loudoun Electric Corporation has 7.2 kv power transmission lines on National Forest land. along NFSR's 34, 61C, 210, 210F, 210N, 210P, 210Y, 216, 351, 352, 354, 355, 434, 531, 40541, 40721, 40723, 40724, and 47201, to supply electricity to TWRA Fish Hatchery, Recreation Residences, and residences on private land. Necessary access roads are in place and they are adequate.

TDS Telcom has telephone lines on National Forest land along the same NFSR's as Fort Loudoun Electric Co-op. Necessary access roads are in place and they are adequate.

There are road easements to private individuals on NFSR's 351, 354, 355, 384E, 40520, and McDaniel, Ford, and Whigg easements for access to private land. Necessary access roads are in place and they are adequate. .

There are seven recreation residences in the analysis area. NFSR 61C, 210, 210B, 210 N, 210P, and 210Y are used to access them. Necessary roads are in place and they are adequate.

Monroe County Road Department has two road easements on National Forest land. One for CH 525, Turkey Creek Road, and the other for CH 522, Hemlock Road, and CH 534, Miller Church Road.

TWRA has a Fish Hatchery under a special use permit. NFSR 61C, 210, and 210B are used to access the facilities. Necessary roads are in place and they are adequate.

There is one church on National Forest land. NFSR 44251 is used to access it. Necessary roads are in place and they are adequate.

There are four spring box and water transmission lines special use permits on National Forest land in this analysis area. NFSR 210 or CH are used to access them. Necessary roads are in place and they are adequate.

There is one cemetery on National Forest land. NFSR 384 and 384C are used to access it. Necessary roads are in place and they are adequate.

There is one church sign under special use permit. SR 165 (Cherohala Skyway) is used to access it. Necessary roads are in place and they are adequate.

There is one special use permit for a Rural Fire Department Building. CH 525 is used to access it. Necessary roads are in place and they are adequate.

There is one special use permit for a parking lot on National Forest land. CH 525 and CH 514 are used to access it. Necessary roads are in place and they are adequate.

NFSR's 24, 57, 126, 210, 352, 384, 384A, 384B, 384C, 434A, 40532, 40533, 40531, 40536, 40541, 40550, 440903, and 44161 are used to access private land.

General Public Transportation (GT)

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

There are no specific communities accessed solely by Forest Service roads that serve the study area. NFSRs in the study area connect to state and county roads that lead to the town of Tellico Plains in Monroe County. The collector road system within the study area is mainly State Highways and county roads but includes all or parts of the following Forest Service collector roads:

Road No.	Road Name
210	Tellico River
126	Bald River
384	Wildcat

GT (2): How does the road system connect large blocks of land in other ownership to public roads (ad hoc communities, subdivisions, in holdings, and so on)?

There are numerous private land inholdings in the study area that are accessed by roads described in GT (1) plus some additional local roads that provide access through easement or special use permit. In addition to the roads in GT (1), the following roads provide access to private land:

Local roads open to the public that provide access to inholdings:

Road No.	Road Name
210	Tellico River
126	Bald River
24	Beaverdam Bald
352	Old CCC Camp
352A	Old CCC Camp Spur
354	Martin Easement
384	Wildcat
384A	Doc Gaddis Special Use
384C	Miller Cemetery
40531	Shaw Mountain Spur
40532	Old Laurel Ridge
40550	Van Dale Easement (not yet issued)
434A	Turkey Creek ORV Extension

440903	Lula Gap
44161	Johns Creek
44251	Bell Mountain
5023	Green Cove Cemetery
57	Cane Creek
none	McDaniel Easement
none	Wigg Easement

Local roads not usually open to the public that provide access to inholdings:

Road No.	Road Name
351	Thomas Bowen Easement
355	Thomas Tiller Easement
384B	Johns Creek Special Use
384E	Chumney Easement
40520	Cormier Easement
40536	PMG Easement
40541	Caney Branch
none	Strunk rec. residence road

GT (3): How does the road system affect managing roads with shared ownership or with limited jurisdiction (RS 2477, cost-share, prescriptive rights, FLPMA easements, FRTA easements, DOT easements)?

There are no shared ownership (cost-share) roads on the Forest. The FS has a co-operative agreement with Monroe County for sharing various types of roadwork from planning to maintenance on roads of common interest to the FS and to the county.

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

There are several open FS roads in the study area that are objective maintenance level 3, 4, or 5 (suitable for passenger cars). Since they are subject to the Highway Safety Act, safety of road users is a concern. Because they are designed for low speed and low volume, safety is usually not a major issue, but as private land has been subdivided, the number of land owners has increased and has caused in an increase in traffic. There may be a need to work with the counties to accept responsibility for the maintenance of some roads.

The safety of road users on Tellico River road, #210, is primary concern. It is 17.8 miles long and 18 feet wide with an asphalt surface with no shoulders.

Some of the major access needs:

- Green Cove area (private property) which has two small motels, two stores, and numerous year-round camper-trailer sites.
- Bald River Falls
- Numerous F.S. camping areas

- Fishing
- Kayaking
- Tellico OHV trails in N.C.
- State fish hatchery
- Bald River Gorge Wilderness

Recent traffic counts taken by TDOT and by FHWA contractor provided the following:

Section	AADT (annual average daily traffic)
TN 165 - Bald River Falls	>600
Bald River Falls - Green Cove	>400
Green Cove - State Line	>100

The threshold for a road to be considered a low volume road is 400 AADT.

There have been discussions concerning limiting the size of vehicles on the road, but enforcement of limitations would be impractical.

The posted speed limit is 25 mph and there are warning signs. Additional warning signs in advance of some of the curves will be considered.

The objective maintenance level 3, 4, & 5 roads receive routine maintenance which normally consists of blading graveled surface twice a year and roadside mowing every two years. Other maintenance activities that are done on an as-needed basis include gravel placement, hazard tree removal, slide repair, pothole repair, etc.

Most of the other roads (ML's 1 & 2) in the area are not usually open to the public and are used only when needed for specific purposes or managed for other uses, such as hunter access, horse trails, or timber sales. Safety is not as much of a concern on those roads since there is generally single use and very little traffic.

Administrative Uses (AU)

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

Addressed in Forest Wide RAP

AU (2): How does the road system affect investigative or enforcement activities?

Installing gates on the following roads will aid these activities by reducing the potential for illegal activities:

#24, #40531, #40532, #40541, #341B, #384A, #434, and #434A

Installing barriers or decommissioning the following roads will aid these activities by reducing the potential for illegal activities:

System roads: #2051, #352A

Unauthorized roads: spur of off #35, spur off of #40531, spur off of #40532

The construction of new roads or adding unauthorized roads to the transportation system would not adversely affect these activities if the roads are adequately closed to public motor vehicle use.

Protection (PT)

PT (1): How does the road system affect fuels management?

Addressed in Forest Wide RAP

PT (2): How does the road system affect the capacity of the Forest Service and cooperators to suppress wildfires?

Addressed in Forest Wide RAP

PT (3): How does the road system affect risk to firefighters and to public safety?

Addressed in Forest Wide RAP

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

Addressed in Forest Wide RAP

Recreation – Unroaded Recreation (UR)

UR (1): Is there now or will there be in the future excess supply or excess demand for unroaded recreation opportunities?

There is currently an excess demand for unroaded recreation opportunities in the subject area and is expected to increase in the near future. Based on National Visitor Use Monitoring Results for Cherokee National Forest in August 2003, the urban markets support specialized recreation activities such as mountain biking, whitewater adventure and weekend backcountry excursions. Rural markets generally support fishing, off-road vehicle use (OHV) and hunting. More generalized recreation activities such as sightseeing with day-hikes and scenic drives are supported by both markets.

UR (2): 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?

Management decisions affecting the open and closed roads within MUTR will have a direct impact to the quantity, quality, and type of unroaded recreation opportunities in and around Bald River Gorge Wilderness and Upper Bald River Gorge Wilderness Study Area. At a forest-scale, the Tellico River Recreation Zone, which encompasses a majority

of the Upper Tellico portion of the watershed, is a major recreational component of the MUTR.

UR (3): What are the adverse effects of noise and other disturbance caused by developing, using, and maintaining roads, on the quantity, quality, and type of unroaded recreation opportunities?

Noise from motorized traffic would diminish the backcountry experience, i.e. traffic on Cherohala Skyway can be heard within Citico Creek Wilderness.

UR (4): Who participates in unroaded recreation in the areas affected by building, maintaining, and decommissioning roads?

Hikers, bikers, hunters, anglers, whitewater enthusiasts, sightseers, and equestrians

UR (5): What are these participants' attachments to the area, how strong are their feelings, and are alternative opportunities and locations available?

User groups mentioned above have strong attachments to the area. Management decisions are scrutinized by the local community. Alternative opportunities and locations for the user groups are not readily available.

Recreation - Road Related Recreation (RR)

RR (1): Is there now or will there be in the future excess supply or excess demand for roaded recreation opportunities?

There is currently not an excess supply or demand for roaded recreation, however as the subject area becomes more popular with recreation enthusiasts and local residents demand for additional roads could increase.

RR (2): Is developing new roads into unroaded areas, decommissioning existing roads, or changing maintenance of existing roads causing significant changes in the quantity, quality, or type of roaded recreation opportunities?

Construction of the Cherohala Skyway has greatly expanded the quantity, quality and type of road-related recreation opportunities especially sightseeing. This has created an expectation and need for quality recreation signs along the skyway. Many of the original signs have disappeared or currently provide wrong information or lead visitors to sub-standard recreation opportunities. In FY 2009 funds will be available to improve recreation signs along the skyway that affect recreational use in MUTR.

RR (3): What are the adverse effects of noise and other disturbances caused by building, using, and maintaining roads on the quantity, quality, or type of roaded recreation opportunities?

Noise from motorized traffic would diminish the backcountry experience, i.e. traffic on Tellico OHV area (Nantahala NF) can be heard from Upper Bald River Gorge Study Area and the campgrounds adjacent to the OHV area**.**

RR (4): Who participates in road-related recreation in the areas affected by road building, changes in road maintenance, or road decommissioning?

Hikers, bikers, hunters, anglers, whitewater enthusiasts, sightseers, and equestrians

RR (5): What are these participants attachments to the area, how strong are their feelings, and are alternative opportunities and locations available?

User groups mentioned above have strong attachments to the area. Management decisions are scrutinized by the local community. Alternative opportunities and locations for the user groups are not readily available.

Passive-Use Value (PV)

PV (1): Do areas planned for road entry, closure, or decommissioning have unique physical or biological characteristics, such as unique natural features and threatened or endangered species?

Detailed surveys have not been conducted within all portions of the watershed. If areas planned for road entry do have unique features then they will be considered during the planning process.

PV (2): Do areas planned for road construction, closure, or decommissioning have unique cultural, traditional, symbolic, sacred, spiritual, or religious significance?

Addressed in Forest Wide RAP

PV (3): What, if any, groups of people (ethnic groups, subcultures, and so on) hold cultural, symbolic, spiritual, sacred, traditional, or religious values for unroaded areas planned for road entry or road closure?

No identified groups hold cultural, symbolic, spiritual, sacred, traditional, or religious values for unroaded areas planned for road entry or road closure.

PV (4): Will road construction, closure, or decommissioning significantly affect passive-use value?

Addressed in Forest Wide RAP

Social Issues (SI)

SI (1): What are people's perceived needs and values for roads? How does road management affect people's dependence on, need for, and desire for roads?

Middle/Upper Tellico RAP

The construction of the Cherohala Skyway between Tellico Plains, TN and Robbinsville, NC is an example of how this social issue has been debated and resolved. Presently, cooperative management of the road and connected recreation facilities and opportunities directly affects people's dependence on, need for, and desire for the road. Cooperating management agencies include Cherokee National Forest, Nantahala National Forest, Departments of Transportation in NC and TN, and county governments.

SI (2): 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?

Addressed in Forest Wide RAP

SI (3): How does the road system affect access to paleontological, archaeological, and historical sites?

Addressed in Forest Wide RAP

SI (4): How does the road system affect cultural and traditional uses (such as plant gathering, and access to traditional and cultural sites) and American Indian treaty rights?

Addressed in Forest Wide RAP

SI (5): How are roads that are historic sites affected by road management?

Addressed in Forest Wide RAP

SI (6): How is community social and economic health affected by road management (for example, lifestyles, businesses, tourism industry, infrastructure maintenance)?

The Cherohala Skyway has become a central component of the area's tourism industry. It's designation as a national scenic byway promotes visitation through various media outlets including a billboard on Interstate 75 near Exit #60 (Junction with Highway 68). Other roads in the assessment area provide visitor access to promoted natural attractions, i.e. Bald River Falls.

SI (7): What is the perceived social and economic dependency of a community on an unroaded area versus the value of that unroaded area for its intrinsic existence and symbolic values?

The community's recognition of remote backcountry as an attraction and potential economic resource has increased over the years. Recreation opportunities linked to the unroaded areas in and adjacent to the Middle Upper Tellico assessment area are presently being advertised by Tennessee Overhill Heritage Association (non-profit organization) in various media outlets including *Backpacker* magazine.
http://www.tennesseeoverhill.com/

SI (8): How does road management affect wilderness attributes, including natural integrity, natural appearance, opportunities for solitude, and opportunities for primitive recreation?

In general paved roads provide visitors with a low risk, low challenge traveling experience. Graveled and/or native surfaced roads offer a more challenging, risky experience. Road management in the Tellico River recreation zone presently offers a desirable progression of road conditions commensurate with the desired recreation opportunity spectrum (ROS).

The Cherohala Skyway offers a safe, low risk sightseeing opportunity for passenger vehicles; the adjoining Tellico River Road is paved, but narrow without a centerline. Consequently, the experience traveling to Bald River Falls may be perceived as more challenging and risky. Likewise, continuing to travel on graveled roads adjoining the Tellico River Road, i.e. Wildcat Road or North River Road may be perceived as unsuitable for passenger vehicles and an opportunity to enjoy traveling in a sport utility vehicle or truck.

Several roads in the assessment area lead to trailheads that access roaded and unroaded areas offering more challenging and risky recreation opportunities that may require special skills and equipment i.e. Upper Tellico OHV area and Bald River Gorge Wilderness. The "country miles" traveled on roads that access these various trailheads are essential to creating and maintaining a sense of place characterized by remoteness and primitive infrastructure.

SI (9): What are the traditional uses of animal and plant species within the area of analysis?

The south eastern portion of the watershed is a traditional site for the collection of ramps. Numerous other plant species are collected throughout the watershed though locations are not easily disclosed.

Traditional wildlife uses on the CNF consists predominantly of hunting game species. However, more recent wildlife uses have consisted of non-consumptive activities including wildlife viewing, birding, and photography.

SI (10): How does road management affect people's sense of place?

Cherohala Skyway has allowed more visitors to experience the "overhill" country. Banners hanging off light posts through Tellico Plains, TN identify this community as the gateway to the Cherokee National Forest. Management of Cherohala Skyway and Tellico River Road can enhance or detract from the desired the sense of place through recreation guide signs and the built environment.

As stated for SI 8, the traffic surface level and maintenance levels of roads leading to remote backcountry recreation areas should be appropriate for the desired ROS setting. Road management in terms of controlling motorized access to remote areas of the national forest directly impacts the sense of place and recreation experience.

Two areas of concern within the assessment area include Whigg Meadow and Beaverdam Bald. If a visitor reaches these high elevation meadows by a non-motorized trail, the presence of motorized vehicles at the site diminishes their desired experience sought in a semi-primitive non-motorized setting. The social value of providing a non-motorized trail destination versus the value of offering motorized access to the same destination should be considered in making road management decisions.

Civil Rights and Environmental Justice (CR)

CR (1): How does the road system, or its management, affect certain groups of people (minority, ethnic, cultural, racial, disabled, and low-income groups)?

Addressed in Forest Wide RAP

Table 2. Documentation for Roads Analysis Process Step 4.

Question Number	Addressed in Analysis?	Rationale For Questions Not Addressed
EF (1)	Yes	
EF (2)	No	Addressed in Forest RAP
EF (3)	No	Addressed in Forest RAP
EF (4)	Yes	
EF (5)	Yes	
AQ (1)	Yes	
AQ (2)	Yes	
AQ (3)	Yes	
AQ (4)	Yes	
AQ (5)	Yes	
AQ (6)	Yes	
AQ (7)	Yes	
AQ (8)	Yes	
AQ (9)	Yes	
AQ (10)	Yes	
AQ (11)	Yes	
AQ (12)	Yes	
AQ (13)	No	Addressed in Forest RAP
AQ (14)	Yes	
TW (1)	No	Addressed in Forest RAP
TW (2)	No	Addressed in Forest RAP
TW (3)	No	Addressed in Forest RAP
TW (4)	Yes	
EC (1)	Yes	
EC (2)	Yes	
EC (3)	Yes	
TM (1)	Yes	
TM (2)	Yes	
TM (3)	Yes	
MM (1)	No	Addressed in Forest RAP/Non applicable to CNF
RM (1)	No	Addressed in Forest RAP/Non applicable to CNF
WP (1)	Yes	
WP (2)	Yes	
WP (3)	Yes	
SP (1)	Yes	
SU (1)	Yes	
GT (1)	Yes	
GT (2)	Yes	
GT (3)	Yes	
GT (4)	Yes	
AU (1)	No	Addressed in Forest RAP
AU (2)	Yes	
PT (1)	No	Addressed in Forest RAP
PT (2)	No	Addressed in Forest RAP
PT (3)	No	Addressed in Forest RAP

Table 2. Documentation for Roads Analysis Process Step 4.

Question Number	Addressed in Analysis?	Rationale For Questions Not Addressed
PT (4)	No	Addressed in Forest RAP
UR (1)	Yes	
UR (2)	Yes	
UR (3)	Yes	
UR (4)	Yes	
UR (5)	Yes	
RR (1)	Yes	
RR (2)	Yes	
RR (3)	Yes	
RR (4)	Yes	
RR (5)	Yes	
PV (1)	Yes	
PV (2)	Yes	
PV (3)	Yes	
PV (4)	No	Addressed in Forest RAP
SI (1)	Yes	
SI (2)	No	Addressed in Forest RAP
SI (3)	No	Addressed in Forest RAP
SI (4)	No	Addressed in Forest RAP
SI (5)	No	Addressed in Forest RAP
SI (6)	Yes	
SI (7)	Yes	
SI(8)	Yes	
SI (9)	Yes	
SI (10)	Yes	
CR (1)	No	Addressed in Forest RAP

Ability of the Road System to meet Objectives

To meet the objective of determining needed and unneeded roads (minimum road system needed), each road was evaluated to determine its uses. These uses are displayed in Table 4

- Recreation/Heritage Access
- Vegetation Management Access
- Access to Private Land/Special Uses
- Wildlife/Fish Management
- Fire Management

Based on these uses, the needed road system, as well as unneeded roads, were identified. The results of this analysis indicate that there are roads that could be decommissioned.

Also, roads were identified for which the standard or management should be changed or examined further.

STEP 5. DESCRIBING OPPORTUNITIES AND SETTING PRIORITIES

Purpose and Products

The purpose of this step is to:

- compare the current road system with what is desirable or acceptable, and
- describe options for modifying the road system that would achieve desirable or acceptable conditions.

The products of this step are:

- a map and descriptive ranking of the problems and risks posed by the current road system,
- a map and list of opportunities, by priority, for addressing important problems and risks, and
- a prioritized list of specific actions, projects, or forest plan adjustments requiring NEPA analysis.

Problems and Risks Posed by the Current Road System

Overall Priorities for Middle/Upper Tellico Assessment Area

The priorities listed below in the table and in the site-specific descriptions are prioritized by resource area. The Team analyzed the individual resource priorities in order to develop larger, overall priorities for the assessment area. These priorities are:

- Recreation/Heritage Access
- Vegetation Management Access
- Access to Private Land/Special Uses
- Wildlife/Fish Management
- Fire Management.

Road Maintenance Needs

During the course of completing condition surveys of the Forest Service roads within this assessment area, data was gathered on maintenance needs on the FS roads open to motor vehicle use. Data on roads closed to motor vehicle use is based on random sampling. Condition surveys were also completed on unauthorized roads that have the potential to be added to the system. The anticipated NFSR # is in parenthesis. The table 3 lists the work needed.

Table 3. Road Maintenance Needed on National Forest System Roads in the Middle/Upper Tellico River Assessment Area

ROAD #	NAME	LENGTH	ANNUAL COSTS	DEFERRED COSTS	MACHINE GRADE	GRAVEL	DITCH	PAVE	BRUSH	BRIDGE MAINT.	CULVERTS	REMARKS
24	BEAVERDAM BALD	1.93	$363	$8,646	X	X	X		X		AOP Barrier at Big Oak Cove	
34	BUCKHORN	0.5	$94	$2,240	X	X			X			
34	BUCKHORN	1.01	$190	$4,525					X			
35	CITICO CREEK SOUTH	1.28	$8,824	$12,358				X	X			
57	CANE CREEK	1.11	$7,652	$10,717	X	X	X		X			
61	SYCAMORE	0.41	$2,827	$3,959	X	X	X		X	X		
76	LYONS CREEK (OLD FURNACE)	0.23	$1,586	$2,221	X	X	X		X			
126	BALD RIVER	2.03	$13,995	$19,600	X	X	X		X			
210	TELLICO RIVER	17.79	$226,823	$536,653			X	X	X	X		
216	NORTH RIVER SHORTCUT	0.67	$4,619	$6,469	X	X	X		X	X		
217	NORTH RIVER	0.01	$82	$131	X		X	X	X			
341	CONASAUGA CREEK	2.02	$13,926	$19,503	X				X			
351	THOMAS BOWEN EASEMENT	0.09	$620	$869					X			
352	OLD CCC CAMP RD.	0.62	$117	$2,778					X			
353	BILLY RIDGE	1.08	$203	$4,838					X			
354	MARTIN EASEMENT	0.13	$24	$582					X			
355	THOMAS TILLER EASEMENT	0.06	$11	$269					X			
384	WILDCAT CREEK	2.51	$17,304	$24,234	X	X	X		X	X		

ROAD #	NAME	LENGTH	ANNUAL COSTS	DEFERRED COSTS	MACHINE GRADE	GRAVEL	DITCH	PAVE	BRUSH	BRIDGE MAINT.	CULVERTS	REMARKS
434	TURKEY CR. MTN. ORV	1.21	$227	$5,421					X			
2041	SAWMILL FIRE	1.22	$229	$5,466					X			
2051	OLD HEMLOCK	1.41	$265	$6,317					X			
2051	OLD HEMLOCK	0.28	$53	$1,254					X			
2051	OLD HEMLOCK	1.10	$237	$3,037					X			
2052	LOWER HOBBS HOLE	0.61	$115	$2,733					X			
2055	CANEBRAKE RIDGE	1.25	$235	$5,600					X			
2069	QUARRY CREEK	0.58	$109	$2,598					X			
3410	HOG BRANCH	0.25	$47	$1,120					X			
4251	COWMIRE	2.31	$434	$10,349					X			
4252	HUCKLEBERRY RIDGE	0.00	$0	$0					X			
4521	TURKEY CREEK KNOB	1.70	$320	$7,616					X			
4522	TURKEY LEAD	0.56	$105	$2,509					X			
5023	GREEN COVE CEMETERY	1.18	$8,135	$11,393	X	X	X		X			
40410	FLATS MTN.	0.07	$13	$314					X			
40520	CORMIER EASEMENT	0.11	$21	$493					X			
40530	LAUREL CREEK	0.45	$85	$2,016					X			
40531	SHAW MTN. SPUR	1.29	$243	$5,779					X			
40532	OLD LAUREL RIDGE	0.21	$39	$941					X			
40533	BUCK POINT	0.26	$56	$718					X			
40536	PMG EASEMENT	0.07	$13	$314					X			
40540	BUCK BRANCH	0.96	$180	$4,301					X			

ROAD #	NAME	LENGTH	ANNUAL COSTS	DEFERRED COSTS	MACHINE GRADE	GRAVEL	DITCH	PAVE	BRUSH	BRIDGE MAINT.	CULVERTS	REMARKS
40541	CANEY BRANCH	1.95	$367	$8,736					X		Possible AOP barrier	
40542	CANEY RIDGE	1.02	$219	$2,816					X			
40543	CANEY RIDGE SPUR	0.26	$56	$718					X			
40550	VAN ASDALE EASEMENT	0.80	$150	$3,584					X			
40551	HENSON MOUNTAIN	1.64	$308	$7,347					X			
40561	BIG BRANCH	0.37	$70	$1,658					X			
40631	BASIN CREEK	2.37	$446	$10,618					X			
40641	NATTY CREEK SPUR	0.03	$6	$134					X			
40680	OLD TN 68	0.10	$19	$448					X			
40681	BIG RIDGE	0.81	$152	$3,629					X		AOP barrier	
40682	STILLHOUSE CREEK	0.31	$58	$1,389					X			
40683	BIG RIDGE SPUR	0.07	$13	$314					X			
40721	SPIVEY CREEK	0.65	$122	$2,912					X			
40723	PRICE ACCESS	0.21	$39	$941					X			
40724	PHEASANT BRANCH	0.34	$64	$1,523					X			
40831	PANTHER BRANCH	4.56	$857	$20,429					X			
40832	MAPLE CAMP LEAD	1.64	$308	$7,347					X			
40841	SUGAR MOUNTAIN	1.45	$273	$6,496					X			
40892	UPPER SYCAMORE	0.79	$149	$3,539					X			
40921	SUGAR MTN. LEAD	0.16	$30	$717					X			

ROAD #	NAME	LENGTH	ANNUAL COSTS	DEFERRED COSTS	MACHINE GRADE	GRAVEL	DITCH	PAVE	BRUSH	BRIDGE MAINT.	CULVERTS	REMARKS
44091	STEWART BRANCH	0.76	$143	$3,405					X			
44092	BOYD FIELD	0.61	$115	$2,733					X			
44151	TURKEY CREEK MTN.	0.71	$133	$3,181					X			
44161	JOHNS CREEK	0.32	$60	$1,434					X			
44171	LOWER WHIGG RIDGE	0.42	$79	$1,882					X			
44251	BELL MOUNTAIN	0.21	$39	$941					X			
47201	MANGUS BRANCH	0.69	$148	$1,905					X			
404401	SMOKEY RUN	2.54	$478	$11,379					X			
440903	LULA GAP	0.24	$1,655	$2,317	X	X	X		X			
2051A	OLD HEMLOCK SPUR	0.53	$100	$2,374					X			
210A	RANGER STATION & WC.	0.57	$8,518	$29,411				X	X			
210B	PHEASANT FIELD	0.42	$5,087	$10,053	X	X	X		X			
210C	BABY FALLS PARKING	0.05	$606	$1,197	X	X	X		X			
210D	WALNUT GROVE PARKING	0.04	$484	$957				X	X			
210E	PANTHER BRANCH PARKING	0.04	$484	$957				X	X			
210F	SPIVEY COVE	0.56	$6,782	$13,404	X	X	X		X		AOP barrier	
210G	ROUGH RIDGE SPUR	1.70	$0	$0								
210H	BIG OAK COVE REC.AREA	0.12	$1,453	$2,872	X	X	X		X			

ROAD #	NAME	LENGTH	ANNUAL COSTS	DEFERRED COSTS	MACHINE GRADE	GRAVEL	DITCH	PAVE	BRUSH	BRIDGE MAINT.	CULVERTS	REMARKS
210J	N. RIVER CHECKING STATION	0.07	$483	$676	X	X	X		X			
210K	DAM CREEK PICNIC AREA	0.01	$121	$239				X	X			
210L	SOURWOOD CAMPGROUND	0.20	$38	$896	X				X			
210N	OLD CABIN SPECIAL USE	0.18	$34	$806					X		Possible AOP barrier	
210P	OLD CABIN	0.08	$15	$358					X			
210R	PHEASANT FIELD PARKING	0.03	$363	$718					X			
210T	DAVIS BR. CAMPGROUND	0.02	$242	$479					X			
210U	OOSTERNECK PARKING	0.04	$484	$957								
210Y	BALLARD SPECIAL USE	0.10	$19	$448					X			
2417B	DEEP GAP	0.35	$66	$1,568					X			
341B	CONASAUGA SPUR B	0.25	$47	$1,120					X			
34A	BUCKHORN SPUR	1.20	$226	$5,376					X			
34B	BUCKHORN SPUR B	1.15	$216	$5,152					X			
352A	OLD CAMP SPUR	0.10	$22	$276					X			
384A	DOC GADDIS SPEC.USE	0.37	$70	$1,658					X			
384B	JOHNS CR.SPECIAL USE	0.60	$113	$2,688					X			

ROAD #	NAME	LENGTH	ANNUAL COSTS	DEFERRED COSTS	MACHINE GRADE	GRAVEL	DITCH	PAVE	BRUSH	BRIDGE MAINT.	CULVERTS	REMARKS
384C	MILLER CEMETERY	1.43	$9,858	$13,807	X	X	X		X			
384E	CHUMNEY EASEMENT	0.13	$24	$582					X			
4251A	COWMIRE SPUR	0.03	$6	$134					X			
434A	TURKEY CREEK ORV EXTENSION	0.35	$66	$1,568					X			
61B	WHIGG MEADOW-MUD GAP	0.66	$124	$2,957	X	X	X		X			
61B	WHIGG MEADOW-MUD GAP	0.68	$128	$3,046	X	X	X		X			
61C	OLD SYCAMORE	0.14	$26	$627					X			

Opportunities for Road Management

Table 4 summarizes recommendations in response to the issues identified in Step 3 and the questions answered in Step 4. A more detailed narrative follows the table. Maps are included in Attachment A to assist in tracking the recommendations. Each specialist identified recommendations based on how roads affected their resource; therefore, conflicting recommendations may exist between resource areas due to differing needs.

Table 4. Summary of Road Recommendations by Issues

ROAD #	Name	Mileage in Watershed	Private Access	WildFire Suppression Use	Recreation/ Heritage Use	Wildlife Use	Vegetation Management	Environmental Risk	Recommendation to be considered
NATIONAL FOREST SYSTEM ROADS									
24	BEAVERDAM BALD	1.93	Y before the end	Y adds 6 mile walk	Used by OHV and hunters	Openings at end		OHVs accessing 1.B	Manage as is.
34	BUCKHORN	1.51	FLEC powerline	Y and RX	Hunting, Motorcycle trail	Openings access linear opening 34a out of WA	Y		Needs maintenance. Manage as is.
35	CITICO CREEK SOUTH	1.28	Y	Y and RX	Hunting	N	Y	Kudzu, In stream channel	Turkey Creek Cutoff. Manage as is.
57	CANE CREEK	1.11	Y off North End Black Ankle	Y and RX	Hunting	N	Y		
61	SYCAMORE	0.41	N	Y and RX	Hunting, Whigg Meadow	Y	Y		Closed in winter. Manage as is.

ROAD #	Name	Mileage in Watershed	Private Access	WildFire Suppression Use	Recreation/ Heritage Use	Wildlife Use	Vegetation Management	Environmental Risk	Recommendation to be considered
76	LYONS CREEK (OLD FURNACE)	0.23	Y	Y and RX	Hunting, trail	Y	Y		Manage as is
126	BALD RIVER	2.03	Y electronic site	Y and RX	Holly Flat, Wilderness, Fishing	Y	Y		Manage as is
210	TELLICO RIVER	17.79	Y, SUP	Y and RX	Recreation Corridor	Y	Y	Riparian Zone	Manage as is
216	NORTH RIVER SHORTCUT	0.67	N	Y and RX	Recreation Corridor	Y	Y		Manage as is
217	NORTH RIVER	0.01	Powerline access	Y and RX	Recreation Corridor	Y	Y	Riparian Zone	Manage as is
341	CONASAUGA CREEK	2.02	Y	Y and RX	Hunting	Y	Y	Dumping	Manage as is
351	THOMAS BOWEN EASEMENT	0.09	Y	Y and RX					Manage as is
352	OLD CCC CAMP RD.	0.62	Y	Y and RX	Hunting	N	Y		Needs Maintenance, Request county to assume maintenance.
354	MARTIN EASEMENT	0.13	Y	Y and RX	Hunting	N	Y		Manage as is. ADD TO GIS ROAD LAYER
353	BILLY RIDGE	1.08	Y	Y and RX	Hunting	N	Y	In stream channel first part	In good shape. Decommission first segment (approx. 0.4 mi.) and if further veg mgt relocate, if possible. If no veg mgt leave as is.
355	THOMAS TILLER EASEMENT	0.06	Y	Y and RX	Hunting	N	Y		Manage as is
384	WILDCAT CREEK	2.51	Y	Y and RX	Hunting/ Trail	Y	Y	Kudzu	Manage as is.

ROAD #	Name	Mileage in Watershed	Private Access	WildFire Suppression Use	Recreation/ Heritage Use	Wildlife Use	Vegetation Management	Environmental Risk	Recommendation to be considered
434	TURKEY CR. MTN. ORV	1.21	Powerine access	Y and RX	Hunting, OHV Trail from 165 to buckhorn/North river	N	Y		Needs Maintenance. Gate at intersection with Buckhorn and 165
2041	SAWMILL FIRE	1.22	N	Y and RX	Hunting	Y linear/spots	Y	Stream crossing	Decommission and pull culvert if no veg mgt off of road (7.A)
2051	OLD HEMLOCK	1.41	N	Y and RX	Hunting	Y	Y		Manage as is.
2051	OLD HEMLOCK	0.28	N	Y and RX	Hunting	Y	Y		7.A Decommission and berm at skyway
2051	OLD HEMLOCK	1.10	N	Y and RX	Hunting	N	N		7.A Decommission and berm at skyway
2052	LOWER HOBBS HOLE	0.61	N	Y and RX	Hunting	Y linear/spots	Y		Manage as is.
2055	CANEBRAKE RIDGE	1.25	Y	Y and RX	Hunting	Y linear/spots	Y		Oosterneck Manage as is.
2069	QUARRY CREEK	0.58	TVA powerline	Y and RX	Hunting	N	Y		Manage as is.
3410	HOG BRANCH	0.25	N	Y and RX	Hunting	Y linear	Y		Manage as is.
4251	COWMIRE	2.31	N	Y and RX	Hunting	Y linear	Y		Manage as is.
4252	HUCKLEBERRY RIDGE	0.00	N	Y and RX	Hunting	Y linear	Y		Manage as is.
4521	TURKEY CREEK KNOB	1.70	N	Y and RX	Hunting	Y linear/spots	Y	Parallels/Creek crossing	Manage as is.

ROAD #	Name	Mileage in Watershed	Private Access	WildFire Suppression Use	Recreation/ Heritage Use	Wildlife Use	Vegetation Management	Environmental Risk	Recommendation to be considered
4522	TURKEY LEAD	0.56	N	Y and RX	Hunting	Y linear/spots	Y		Manage as is.
5023	GREEN COVE CEMETERY	1.18	Y	Y and RX	Hunting/Fishing	Y spot	Y		Manage as is.
40410	FLATS MTN.	0.07	N	Y and RX	Trailhead	Y spot	Y		Manage as is.
40520	CORMIER EASEMENT	0.11	Y	Y and RX	Hunting	N	Y		Manage as is.
40530	LAUREL CREEK	0.45	N	Y and RX	Hunting	N	Y	Kudzu	Decommission. No maintenance concerns. May provide access for Kudzu treatment; Use for timber harvest? Low priority decommission
40531	SHAW MTN. SPUR	1.29	Y Powerline access	Y and RX	Hunting	N	Y		Needs maintenance. Gate at intersection with FS land (both sides) another gate off of Seng Garden Road and another at intersection with CH514.
40532	OLD LAUREL RIDGE	0.21	N	Y and RX	Hunting	N	N		Manage as is. Transfer to county and gate. Put under permit and gate.
40533	BUCK POINT	0.26	N	Y and RX	Hunting	Y linear	Y maybe 1 stand		Manage as is.
40536	PMG EASEMENT	0.07	Y	Y and RX	Hunting	N	N	Adjacent to creek	Manage as is. Transfer to county and gate. Put under permit and gate.
40540	BUCK BRANCH	0.96	N	Y and RX	Hunting	Y linear	Y		Manage as is.
40541	CANEY BRANCH	1.95	Y	Y and RX	Hunting	N	Y	Stream crossing	FS acquire easement across private Manage as is. ELIMINATE THRU TRAFFIC

ROAD #	Name	Mileage in Watershed	Private Access	WildFire Suppression Use	Recreation/ Heritage Use	Wildlife Use	Vegetation Management	Environmental Risk	Recommendation to be considered
40542	CANEY RIDGE	1.02	N	Y and RX	Hunting	N	Y		Manage as is but close gate
40543	CANEY RIDGE SPUR	0.26	N	Y and RX	Hunting	N	Y		Manage as is but close gate
40550	VAN ASDALE EASEMENT	0.80	Y	Y and RX	Hunting	N	Y		Put under easement .
40551	HENSON MOUNTAIN	1.64	N	Y and RX	Hunting	Y linear/spots	Y		Manage as is.
40561	BIG BRANCH	0.37	N	Y and RX	Hunting	N	Y		Manage as is.
40631	BASIN CREEK	2.37	N	Y and RX	Unmaintained trail	N	Y		Manage as is.
40641	Natty Creek Spur	0.03	N	Y and RX	Hunting	Y linear/spots	Y		Manage as is.
40680	OLD TN 68	0.10	Y	Y and RX	Hunting	N	Y		Manage as is.
40681	BIG RIDGE	0.81	N	Y and RX	Hunting	Y linear	Y		Manage as is.
40682	STILLHOUSE CREEK	0.31	N	Y and RX	Hunting	Y linear	Y		Manage as is.
40683	BIG RIDGE SPUR	0.07	N	Y and RX	Hunting	N	Y		Manage as is.
40721	SPIVEY CREEK	0.65	N powerline access?	Y and RX	Hunting	N	Y		Manage as is.
40723	PRICE ACCESS	0.21	Y Powerline access	Y and RX	Hunting	N	Y		Manage as is.

ROAD #	Name	Mileage in Watershed	Private Access	WildFire Suppression Use	Recreation/ Heritage Use	Wildlife Use	Vegetation Management	Environmental Risk	Recommendation to be considered
40724	PHEASANT BRANCH	0.34	Y Powerline access	Y and RX	Fish hatchery	Y	N		Manage as is.
40831	PANTHER BRANCH	4.56	N	Y and RX	Hunting	N	Y		Manage as is.
40832	MAPLE CAMP LEAD	1.64	N	Y and RX	Hunting	Y linear	Y		Manage as is.
40841	SUGAR MOUNTAIN	1.45	N	Y and RX	Hunting	Y linear	Y		Manage as is. Sugar Mtn Trail Road
40892	UPPER SYCAMORE	0.79	N	Y and RX	BMT trail in vicinity	N	N	12.B	Manage as is.
40921	SUGAR MTN. LEAD	0.16	N	Y and RX	Hunting	Y linear/spots	Y operability?		Manage as is.
44091	STEWART BRANCH	0.76	N	Y and RX	Hunting	N	Y		Manage as is.
44092	BOYD FIELD	0.61	N	Y and RX	Hunting	N	Y		Manage as is.
44151	TURKEY CREEK MTN.	0.71	N	Y and RX	Hunting	N	Y		Manage as is.
44161	JOHNS CREEK	0.32	Y	Y and RX	Hunting	N	Y		Manage as is.
44171	LOWER WHIGG RIDGE	0.42	N	Y and RX	Hunting	N	Y		Manage as is.
44251	BELL MOUNTAIN	0.21	Y Church	Y and RX	Hunting	N	Y		Manage as is.
47201	MANGUS BRANCH	0.69	Y powerline access	Y and RX	Hunting	Y?	Y		Manage as is.
404401	SMOKEY RUN	2.54	N	Y and RX	Hunting	N	Y		Manage as is.

ROAD #	Name	Mileage in Watershed	Private Access	WildFire Suppression Use	Recreation/ Heritage Use	Wildlife Use	Vegetation Management	Environmental Risk	Recommendation to be considered
440903	LULA GAP	0.24	N	Y and RX	Hunting	N	Y		Manage as is. Consider transfering to County or under easement with gate
2051A	OLD HEMLOCK SPUR	0.53	N	Y and RX	Hunting	Y	Y		Manage as is.
210A	RANGER STATION & WC.	0.57	Y powerline access	Y and RX	Office	N	Y	NNIP	Manage as is.
210B	PHEASANT FIELD	0.42	Y	Y and RX	Fish hatchery	Y	N		Manage as is.
210C	BABY FALLS PARKING	0.05	N	Y and RX	Parking lot	N	N	Riparian Zone	Manage as is.
210D	WALNUT GROVE PARKING	0.04	N	Y and RX	Parking lot	N	N	Riparian Zone	Manage as is.
210E	PANTHER BRANCH PARKING	0.04	N	Y and RX	Parking lot	N	N	Riparian Zone	Manage as is.
210F	SPIVEY COVE	0.56	Y powerline access	Y and RX	Camping/CCC	N	N		Manage as is.
210G	ROUGH RIDGE SPUR	1.70		Y and RX					
210H	BIG OAK COVE REC.AREA	0.12	N	Y and RX	Camping	N	N	Riparian Zone	Manage as is.
210J	N. RIVER CHECKING STATION	0.07	N	Y and RX	Service Center	N	N	Riparian Zone	Manage as is. Tellico River Service Center
210K	DAM CREEK PICNIC AREA	0.01	N	Y and RX	CCC/Picnic	Y	N	Riparian Zone	Manage as is.

ROAD #	Name	Mileage in Watershed	Private Access	WildFire Suppression Use	Recreation/ Heritage Use	Wildlife Use	Vegetation Management	Environmental Risk	Recommendation to be considered
210L	SOURWOOD CAMPGROUND	0.20	N	Y and RX	Camping	N	N	Riparian Zone	Manage as is.
210N	OLD CABIN SPECIAL USE	0.18	Y	Y and RX	Rec residences	N	N	Stream crossing	Look at way to elimnate creek crossing No need for loop. Decommission section between driveways to residences, approx. 0.2 mi. Not high priority.
210P	OLD CABIN	0.08	Y	Y and RX	Rec residences	N	N		Manage as is.
210R	PHEASANT FIELD PARKING	0.03	N	Y and RX	Parking lot	N	N	Riparian Zone	Manage as is.
210T	DAVIS BR. CAMPGROUND	0.02	N	Y and RX	Camping	N	N	Riparian Zone	Manage as is.
210U	OOSTERNECK PARKING	0.04	N	Y and RX	Parking lot	N	N		Manage as is
210Y	BALLARD SPECIAL USE	0.10	Y	Y and RX	SUP	N	N		Manage as is.
2417B	DEEP GAP	0.35	N	Y and RX	Hunting	N	Y		Manage as is.
341B	CONASAUGA SPUR B	0.25	N	Y and RX	Hunting	N	Y		Manage as is. But Gate instead of post
34A	BUCKHORN SPUR OUTside Boundary	0.00	N	Y and RX	Hunting	Y	Y		Manage as is.
34B	BUCKHORN SPUR B	1.15	N	Y and RX	Hunting,	N	Y		Manage as is.
352A	OLD CAMP SPUR	0.10	Y not only access	Y and RX	Hunting	N	Y		Gate at a minimum. Decommission

ROAD #	Name	Mileage in Watershed	Private Access	WildFire Suppression Use	Recreation/ Heritage Use	Wildlife Use	Vegetation Management	Environmental Risk	Recommendation to be considered
384A	DOC GADDIS SPEC.USE	0.37	Y	Y and RX	Hunting	N	Y		Gate. Put under permit. Change in database.
384B	JOHNS CR.SPECIAL USE	0.60	Y	Y and RX	Hunting	N	Y		Put under permit
384C	MILLER CEMETERY	1.43	Y	Y and RX	Hunting	Y	Y		Manage as is.
384E	CHUMNEY EASEMENT	0.13	Y	Y and RX	Hunting	N	Y		Manage as is.
4251A	COWMIRE SPUR	0.03	N	Y and RX	Hunting	Y linear	Y		Manage as is.
434A	TURKEY CREEK ORV EXTENSION	0.35	Powerline access High water access	Y and RX	Hunting,	N	Y		Gate at intersection and property line.
61B	WHIGG MEADOW-MUD GAP	0.66	N	Y and RX	Hunting, Whigg Meadow	N	Y		Manage as is.
61B	WHIGG MEADOW-MUD GAP	0.68	N	Y and RX	Hunting, Whigg Meadow	N	N	9.F	Manage as is.
61C	OLD SYCAMORE	0.14	Y	Y and RX	Cabins	N	N	Riparian Zone	Manage as is.

UNAUTHORIZED ROADS:									
ROAD #	**Name**	**Mileage in Watershed**	**Private Access**	**WildFire Suppression Use**	**Recreation/ Heritage Use**	**Wildlife Use**	**Vegetation Management**	**Environmental Risk**	**Recommendation to be considered**
N.A.	off #35; North of #40530	0.03	N	N	Dispersed camping	N	N	Right on creek	Decommission. But provide parking spot with turnaround.
(40535)	Wiggs Easement (off CH514)	0.27	Y also powerline	Y and RX	Hunting	N	Y		Add to system
(40501)	Road to Helispot (off TN165)	0.06	N	Y and RX		N	N		Add to system for helispot access
N.A.	connects #40723 & #40724	0.51	N						Used by Ft Loundon Elec.; add to system
(40552)	McDaniel Easement(off CH513)	0.02	Y						Add to system
N.A.	off #40531	0.14	N						Decommission
N.A.	off #40532	0.02	N						Decommission
N.A.	along Caney Br. Ridge	0.99	N						Decommission
(40842)	Strunk Easement (off #40724)	0.09	N						Add to system

System roads recommended for decommissioning: 3.75
Unauthorized roads recommended for decommissioning: 1.18
Total all roads recommended for decommissioning: 4.93
Unauthorized roads to be added to system: 0.95
Net change to road mileage: -3.98

Recommendations

- Recreation/Heritage Access
- Vegetation Management Access
- Access to Private Land/Special Uses
    - #352: Request county to assume jurisdiction & maintenance.
    - #352A: Decommission if not needed to access private land; if access is needed, install gate.
    - #384A: Install gate; put under permit.
    - #384B: Put under permit.
    - #40550: Put under easement.
    - #434A: Install gates: intersection with TN 165 and at property line.
    - #40541: Acquire easement across private land; install gates at property lines to eliminate thru traffic; determine if pipes at Caney Br. are barriers to AOP.
    - #440903: Consider transferring jurisdiction & maintenance to county or install gate & issue easement.
    - Unauthorized road to Strunk recreation residence: Add to system; #40842.
    - Unauthorized road for McDaniel easement: Add to system: #40552
    - Unauthorized road for Wiggs easement off of CH514: Add to system; #40535
    - #40531: Install gates:
        - lines (both sides)
        -off of Seng Garden Road
        -intersection with CH514
    - Unauthorized road connecting #40723 & #40724: Add to system; Ft Loudoun Electric needs for power line access

- Wildlife/Fish Management
    - #24: replace pipe at Big Oak Cove Cr. with structure that will provide for aquatic organism passage.
    - #434: install gates at #34 and TN165 intersections.
    - #210N: decommission section between driveways to cabins and remove pipe; low priority
    - #353: decommission first segment along stream; if needed for further veg. mgt relocate (if possible). If no veg. mgt leave as is.
    - #2041: decommission and remove 60" diameter culvert if no veg. mgt off of road.
    - #40530: decommission if not needed for veg. mgt.; low priority
    - #2051: decommission two sections:
        -between TN 165 & # 2051A
    - -between TN 165 & TN 165 at Lake View Observation Site
    - Unauthorized road off of #35-1 near Laurel Creek: decommission; provide parking for dispersed camping.
    - Unauthorized road off of #40531: decommission
    - Unauthorized road off of #40532: decommission
    - Unauthorized trail/(road?) along Caney Branch Ridge: decommission

- Fire Management
    - Unauthorized road off of TN 165: add to system as #40501; provides access to helispot.
    - #341B: Replace removable post with gate.

- Non-native Invasive Plants

NEPA Analysis Needs

Many opportunities identified in this report can be incorporated into the Middle/Upper Tellico EA process. If there are some opportunities identified that will not be incorporated into the EA, they will require a site-specific NEPA analysis in the future when the decision is made to implement them (activities other than maintenance and administrative decisions).

STEP 6. REPORTING

Purpose and Products

The purpose of this step is to:
- report the key findings of the analysis.

The products of this step are:
- a report including maps, analyses, and test documentation of the roads analysis, and
- maps that show the data and information used in the analysis, and the opportunities identified during the analysis.

Report

This report will be reviewed by the Cherokee NF, and shared with other offices in the Forest Service that are also working on roads analysis. This report is available to the public if requested, and will be part of the Middle/Upper Tellico project file.

Maps

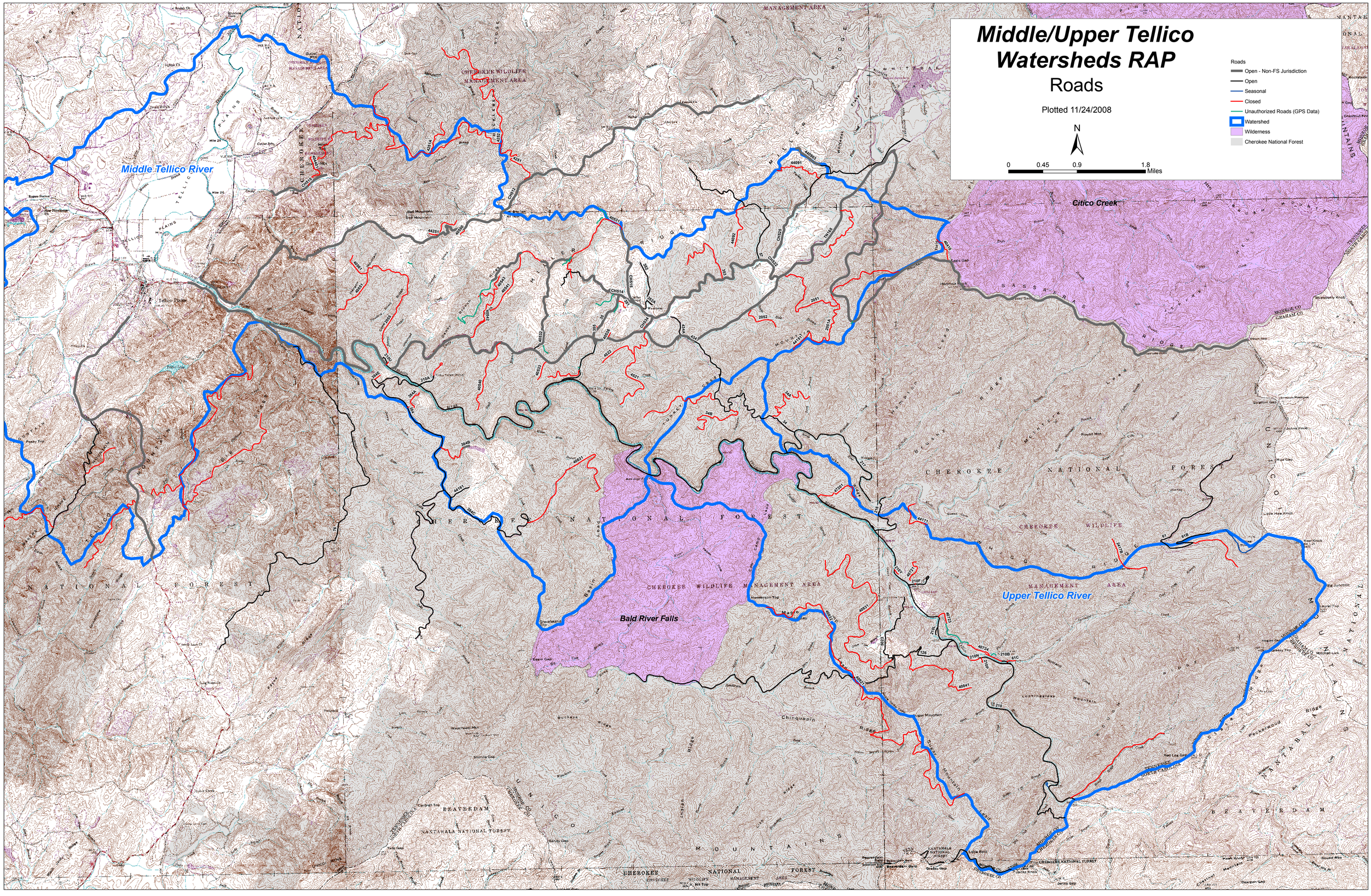
All maps used for this report are included in Attachment A.
Map 1 Roads Areas within Middle Upper Tellico River Analysis area
Map 2 Roads within 100 feet of Streams
Map 3 Roads recommended for management status changes: decommissioning, added to system, changes in jurisdiction, changes in open/closed status.

REFERENCES

Middle/Upper Tellico Watersheds RAP

Roads

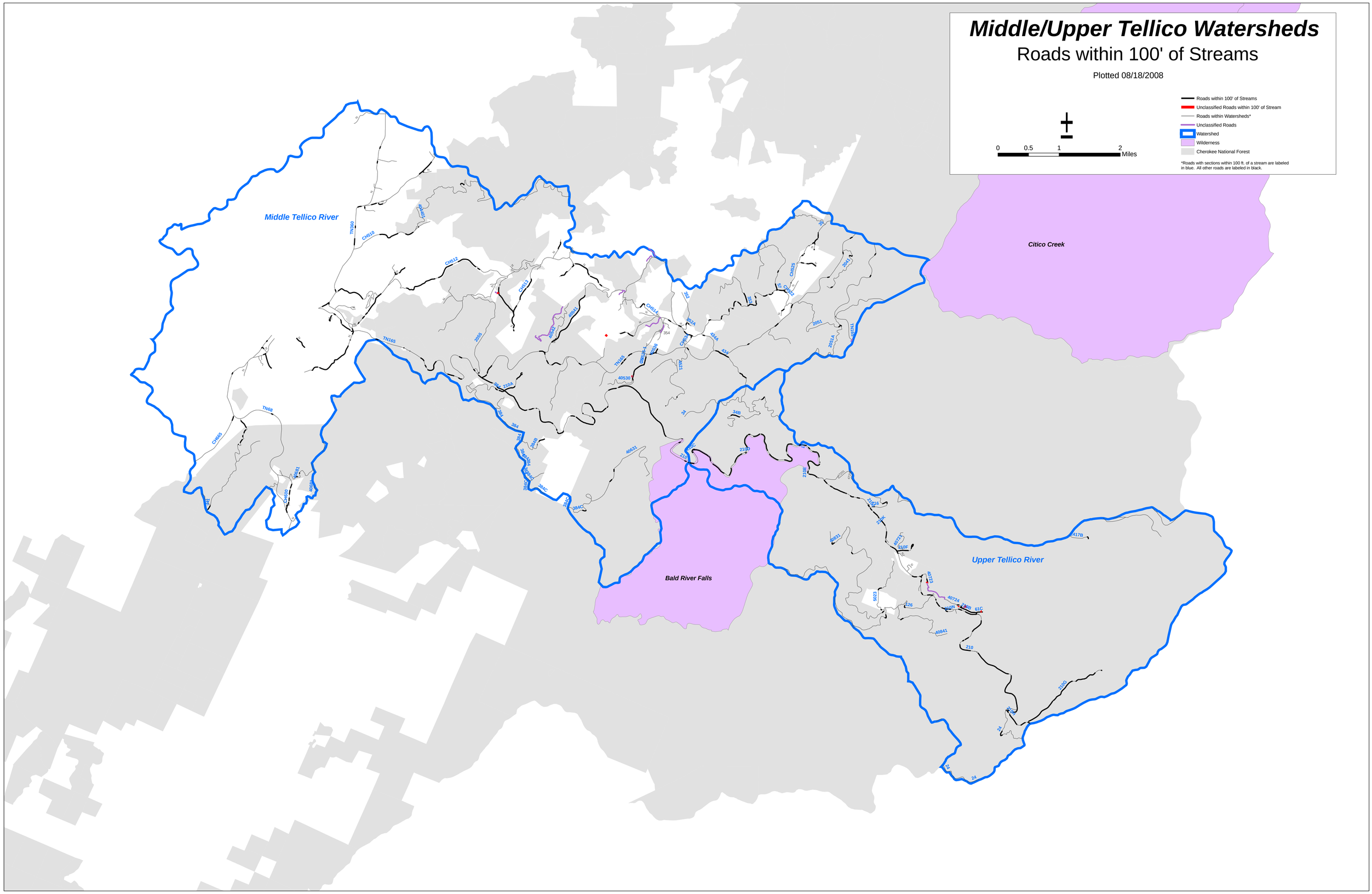
Plotted 11/24/2008



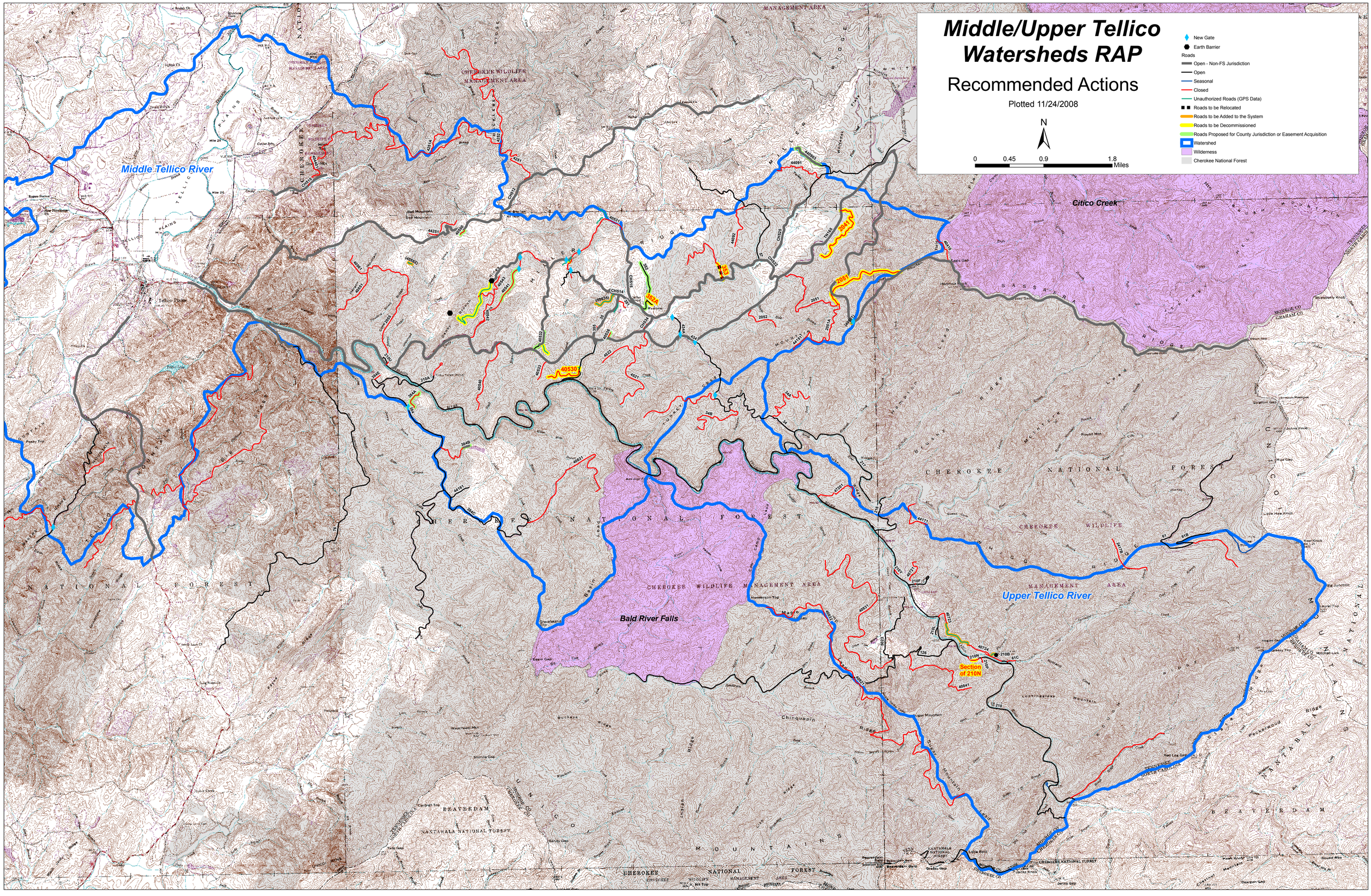
Middle/Upper Tellico Watersheds

Roads within 100' of Streams

Plotted 08/18/2008



Middle/Upper Tellico Watersheds RAP

Recommended Actions

Plotted 11/24/2008