Pisgah National Forest
Nantahala National Forest

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Roads Analysis Process Report

January 2003

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Introduction

Regulations published January 12, 2001, state that, with certain exceptions, every National Forest System administrative unit must have a forest-scale roads analysis completed by January 13, 2003. National direction suggested that this forest-scale Roads Analysis Process (RAP) should, at a minimum, consider arterial and collector roads as they relate to the overall transportation needs and forest resource impacts. The Nantahala/Pisgah Roads Analysis Process evaluates the open road system, which encompasses the arterial and collector roads, as well as some local roads.

The open road system is comprised of 424 roads equaling approximately 806 miles in length. Information was collected for each open road as to the kinds and amounts of uses as well as environmental, social and economic concerns. Information was developed from a variety of sources such as databases, Geographic Information System analysis, and comments from the public, cooperating agencies and the Eastern Band of Cherokee. The analysis also relied heavily on the knowledge of ranger district staff, gained through decades of service in the field.

The NP RAP Report is divided into six chapters and five appendices. The first three chapters set out background and process information. Specific resource-related questions are answered in Chapter 4. Chapter 5 introduces a rating system whereby each open road is evaluated for its potential value for use and resource management, as well as potential environmental and human safety risks. Chapter 6 provides a summary of findings and recommendations. Road maps have been generated separately, since they are too large to be included in an 8 ½ by 11-report format.

This report is a first approximation. Information regarding the transportation system often changes. All road mileages are approximate. All value and risk ratings are subject to change upon closer consideration in a watershed-scale or project-scale RAP.

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Setting up the Analysis

Objectives of the Analysis

The overall objective of this analysis is to provide national forest managers 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. The Nantahala and Pisgah National Forests (subsequently referred to as "the Forests") Forest-Scale Roads Analysis Process (NP RAP) will develop, organize, and display information about the open roads under Forest Service jurisdiction. This information will also be used to support the Nantahala and Pisgah Forest Plan revision and subsequent sub-forest scale and project analyses.

Open roads are typically classified as traffic service levels 3, 4 or 5. In some cases lower service level roads are open to the public, and some of the 3 through 5 roads are closed. Information regarding the open roads will be developed from existing sources of data and expert knowledge. Existing Geographic Information System (GIS) data layers will be utilized to conduct analysis and to display selected results. The GIS will also be used to generate map products for graphical support in this report.

Other objectives of the NP RAP:

1. Identify the potential minimum open road system for the Forests.
2. Identify trouble spots and opportunities for improving the open road system, to help prioritize maintenance and other investments.
3. Evaluate the ability of the existing road system to handle both present and future traffic.
4. Evaluate the values and risks of the open road system.

Interdisciplinary Team Members and Participants

NP RAP Team Members:

Ruth Berner	Biologist – Team Leader
Tim Chesley	Transportation Planner
Richard Burns	Hydrologist
Sheryl Bryan	Fisheries Biologist
Steve Hendricks	Recreation Specialist

NP RAP Team Consultants:

Rangers and Staff of the seven Ranger Districts

Holly Hixon	GIS Specialist
Lisa Coman	Engineering Technician
Rodney Snedeker	Archeologist
Amy Moritz	Fire Planner
John Blanton	Silviculturist
Gary Kauffman	Botanist
Bill Jackson	Air Quality Specialist
Carol Milholen	Planning Assistant
Ray Johns	Special Uses - FERC

Information Needs

The following information, databases, and analyses are available for use during the NP RAP:

- GIS Core Data Layers, including cultural properties, land, recreation, transportation, topography and water, and additional layers such as old growth, special habitats, element occurrences of Threatened, Endangered, and sensitive species, and hydrologic units.
- Watershed Integrity Ranking for Forest Plan Revision, which evaluates the condition and vulnerability of 5th level watersheds, developed as a part of the Eastwide Watershed Initiative.
- The Infra database. Infra provides an integrated data management tool where Forests can enter, manage, and report accurate information and associated financial data on the inventory of their constructed features - features such as buildings, dams, bridges, water systems, roads, trails, developed recreation sites, range improvements, administrative sites, heritage sites, general forest areas and wilderness.

The following additional information, databases, and analyses will be needed:

- Total costs associated with each road, including annual and deferred maintenance and capital improvements.
- Potential Public Forest Service Roads program.
- Forest Highway program priorities.
- State Transportation Information Program (TIPS) for 5 and 20 years projections.
- Forest Land Management Plan conformance study, including open road density by management area polygons.
- Watershed Integrity Ranking for 6th level hydrologic units (HUCS).
- Analysis of stream crossings of roads, by 6th level HUC.
- Identification of roads in or adjacent to the following:
    - Archeological sites
    - Element occurrences of TES species

    - Suitable timber lands
    - Special habitats
- Qualitative assessment of amount and kinds of road uses.

Analysis Plan

The main focus of the NP RAP is National Forest System Roads open for public use the majority of the year. Some additional roads may be referred to for specific purposes, such as roads that are open a portion of the year or used for some specific purpose, or roads that are currently closed that were designed to be open. Additionally, closed roads may figure into evaluating watershed risks or other resource management issues.

<u>Phase One – Gathering Information:</u>

The first step was to establish a list of preliminary issues for the NP RAP and crosswalk that to the list of 71 questions listed in publication FS-643, Roads Analysis: Informing Decisions About Managing the National Forest Transportation System. From the preliminary issues, a spreadsheet was designed as a documentation tool.

Next was the information-gathering phase of the NP RAP. Through a series of meetings with District personnel we determined which roads are actually open and what amount and kinds of uses exist for each open road. We also documented any known problems associated with a particular road. The North Carolina Wildlife Resources Commission, The Eastern Band of the Cherokee, and North Carolina Department of Transportation were consulted for their particular expertise. Over 60 members of the public who use the Nantahala and Pisgah National Forests also contributed information.

<u>Phase Two – Analyzing the Road System</u>

During this phase, individual team members and team consultants used the gathered information along with other existing data sources to conduct analysis. The output from this effort was a series of value and risk ratings for each open road. Values can be thought of as the uses, both existing and potential, that drive the need for that road to exist and remain open. Risks are the areas of concern for a particular road, that indicate a potential for negative impacts to forest resources and/or the people using the road. These are not absolute values and risks, but are only used as a way to compare one open Forest Service road with another, so we may more efficiently and effectively use our limited road management dollars. Each road could accrue up to 11 value points and up to 16 risk points. From these ratings, each open road was assigned a position on the risk/value rating scale. Table I-1 summarizes the value and risk ratings. A detailed description of the rating scheme and results is located in Chapter 5.

TABLE I-1: Risk and Value Rating Scheme

ISSUE OR RESOURCE VALUE	**Available Ratings**
Existing Recreation Uses	0 = low, 1 = medium, 2 = high
Existing Social Uses	0 = low, 1 = medium, 2 = high
Potential for Fire Management	0 = low, 1 = medium, 2 = high. 3 = very high
Potential for Timber Management	0 = low, 1 = medium, 2 = high
Traffic Volume	0 = low, 1 = medium, 2 = high
ISSUE OR RESOURCE RISK	**Available Ratings**
Suppression Risk	0 = low, 1 = medium, 2 = high
Risk to Rare Species and Special Habitats	0 = low, 1 = medium, 2 = high
Heritage Resources Sensitivity	0 = low, 1 = medium, 2 = high
Wildlife Risk	0 = low, 1 = medium, 2 = high
Aquatic Biota Vulnerability	0 = low, 1 = medium, 2 = high
Public Safety Concerns	0 = low, 1 = medium, 2 = high, 3 = very high
Maintenance Cost	0 = low, 1 = medium, 2 = high, 3 = very high

Phase Three – Reporting Findings and Making Recommendations

During this phase, information was synthesized to provide a big-picture look at the road system, while also pointing to specific areas of where concerns or opportunities exist. This phase also resulted in the production of maps to visually display certain information.

Public Involvement

Many and varied opportunities were offered for the public to have input into the NP RAP. Over 300 groups or individuals were contacted by mail, using the Nantahala/Pisgah LRMP mailing list. Through this mass mailing, interested parties were given the option of submitting written comments, e-mail comments, or attending one of nine scheduled open house meetings. Notification of the same three options was made in at least one newspaper in each community where an open house was to take place, and through a number of radio and television public service announcements. An open house meeting was held in each community where a ranger station, district office, or supervisor's office of Nantahala or Pisgah National Forest is located. These Western North Carolina communities were Asheville, Brevard, Highlands, Franklin, Nebo, Burnsville, Hot Springs, Robbinsville, and Murphy.

Among the public comments received, approximately 74 different NFS roads were specifically referenced. Nine roads received three or more comments. These nine were: Santeelah Creek and Wolf Laurel on the Cheoah Ranger District; Blue Valley on the Highlands District; and Turkey Pen Gap, Cathey Creek, Davidson River, Avery Creek, Yellow Gap, Wash Creek, and Headwater on the Pisgah District. Approximately 41 comments were of a more general nature. See Appendix E for a complete list of public comments.

In general, the public expressed positive statements concerning the roads and the current level of maintenance. There was a definite desire expressed to maintain the status quo, to keep most NFS roads as fairly narrow, gravel travelways, so as not to encourage an increased amount of use or travel at a higher rate of speed. In other words, keep a kind of rustic, undeveloped feel to the roads throughout the Forests.

Public comments concerning specific roads were considered in the value/risk rating assigned to each open road. Comments were also passed along to the District Rangers so they could determine if any management actions might be needed to address concerns raised through the comment process.

The participating public most commonly mentioned using NFS roads for accessing the Forest for hiking, mountain biking, hunting, and camping. Another common use of NFS roads mentioned was to access adjacent private property.

Describing the Situation

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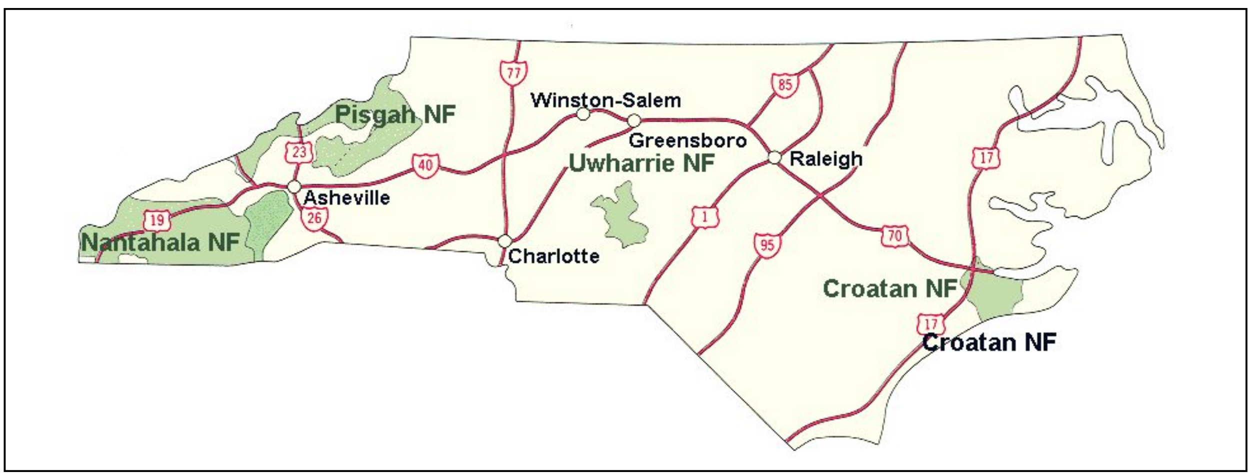
The Analysis Area

Located in the Blue Ridge province of the Appalachian Mountains, the Forests are spread across parts of 21 counties in western North Carolina. The entire 21 county area encompasses 5.7 million acres, of which 4.4 million are forested and or these 1.03 million are National Forest System lands. The lands that today make up the Forests were purchased from private landowners, mostly during the early 1900's. The elevations are typically from 2,000 to 5,000 feet, with numerous higher peaks. The trees are largely deciduous and highly diverse. Rainfall averages 30 to 45 inches per year and there are abundant perennial streams.

The 21-county area has a resident population or approximately 817,508, with the great majority within four counties: Buncombe, Burke, Caldwell, and Henderson. The largest metropolitan area is Asheville, with an area population of 215,000. However, the Forests are within a day's drive of population centers such as Atlanta, Charlotte, Cincinnati, and Nashville. Figure II-1 shows the general location of the Forests.

Figure II-1. General Location of Nantahala and Pisgah National Forests



The National Forest Transportation System

Historical Perspective

Intensive timber harvesting in the mountains of western North Carolina began around 1895, utilizing railroads and splash dams for transporting logs to market. The Pisgah National Forest and the Nantahala National Forest were established as National Forest

Reserves respectively on March 27, 1911 and January 29, 1920. Most of the land acquired during the next 20 years was already cutover or soon would be due to the Chestnut blight during the 1920s. Harvesting timber on National Forest System lands during the 1930's was minimal, but by 1940 higher prices were starting to focus more efforts in timber harvesting.

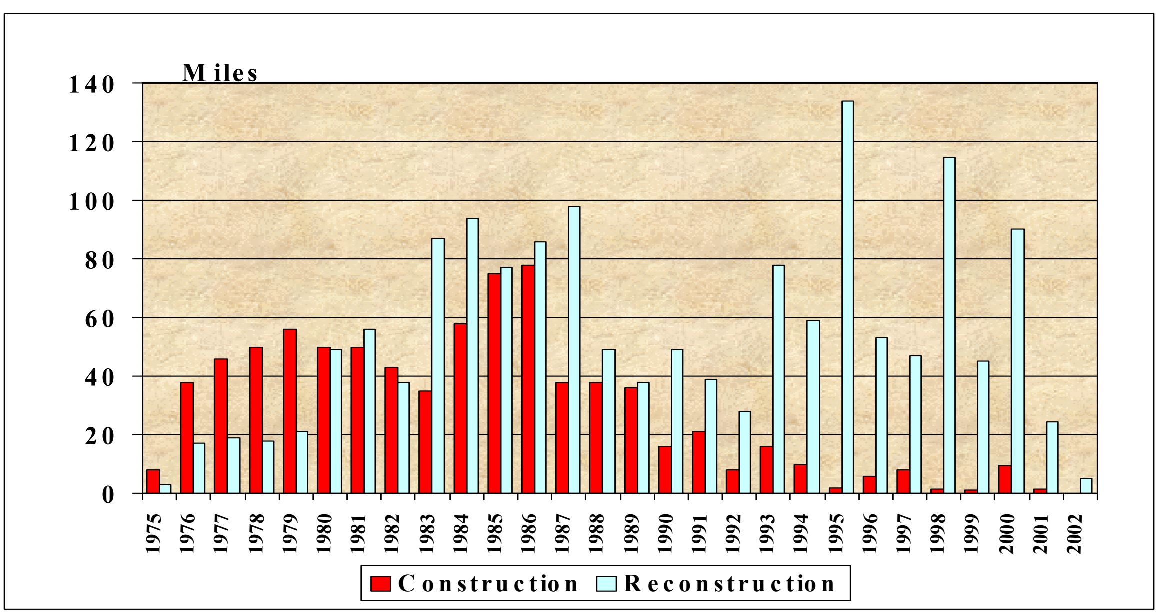
Transportation plans were completed for the Nantahala and Pisgah National Forests (NP) respectively in 1943 and 1945. Of the 1,036,154 acres that make up these forests today, approximately 900,000 acres were then already under Forest Service jurisdiction. The total inventoried road mileage was 732, and the need for construction of 230 miles of new roads was projected during the 20 year planning horizon. Only 49 miles of the planned system was paved two lane roads, with the rest being single-lane gravel and non-surfaced 'truck trails'. On the Pisgah National Forest 94 miles or 26% of system roads were closed. It is interesting to note that many of these closed roads have now become the backbone of the open road system being studied in this report. In 1945, the estimated maintenance cost for the existing system was $84,000 per year, which is equivalent to $800,000 or $1,100 per mile in today's dollars. During the 60 years since these plans were written the population of counties in Western North Carolina has nearly doubled, and the NP open road system has doubled. The primary use of these roads in 1945 was recreation as it is today.

General Description

Forest Service Roads: There are currently 2,348 miles of road under Forest Service jurisdiction for the Nantahala and Pisgah National Forests. Of this total approximately 800 miles have been constructed during the past 25 years at a rate illustrated by Figure II-2. Most of these miles were constructed to support commercial timber operations (approximately 10 % of the miles shown apply to the Croatan and Uwharrie National Forests). Road construction peaked along with the timber program in 1986. Most of these roads were gated and closed after the timber was harvested.

Figure II-2. Road Construction & Reconstruction

National Forests in North Carolina



A continuous decrease in the amount of funds available for reconstruction of the collector and arterial roads, the backbone of the Forest Service system, has occurred as purchaser credit has decreased. The result is a continuous and significant increase in deferred maintenance backlog. Reflected in Figure II-1 is a series of catastrophic storms starting in the late 1970s that have necessitated reconstruction of individual local roads during these years.

As of 10/01/2002, approximately 1,052 miles of National Forest System (NFS) roads were inventoried as open to some degree for public access. Six hundred and forty-five (645) miles are always open. Ninety (90) miles have seasonal closures, primarily due to winter weather and related safety considerations, or at developed recreation sites that are closed during the winter. Approximately 242 miles are classified as restricted roads. Seventy-five (75) miles are open seasonally during hunting season. These roads provide restricted access to some administrative, research and communication sites, access to private in-holdings, and roads that are available by special-use permits such as those providing accessible hunting opportunities. The NP RAP addresses predominantly the approximately 806 miles of roads determined to be open most of the time. A complete list of the roads considered for the NP RAP can be found in Appendix A.

There are other roads (unclassified) on National Forest System land that have been identified, but are not included in the inventory. A complete inventory of these routes is being compiled using GPS technology. It is estimated that approximately 700 miles will be identified. These routes include unplanned, abandoned travel ways, off-road vehicle tracks, roads that were once under permit or other authorization and were never decommissioned upon termination of the authorization. These roads are awaiting management decisions on whether or not to include them as part of the transportation system or to decommission or restrict them to further use. The analysis for these decisions will be made at the watershed or project scale.

Thirty-one percent of the total road system (736.4 miles) are managed and maintained for public use with passenger cars. These roads are maintained to varying standards depending on the level of use and management objectives. There are five maintenance levels used by the Forest Service to determine the work needed to preserve the investment in the roads.

Direction on how to meet the five levels is included in *FSH 7709.58 – Transportation System Maintenance Handbook.* Table II-1 summarizes the miles for the four maintenance levels that apply to roads being considered in this analysis.

- ***Maintenance Level 5:*** *Assigned to roads that provide a high degree of user comfort and convenience.*
- ***Maintenance Level 4:*** *Assigned to roads that provide a moderate degree of user comfort and convenience at moderate travel speeds.*
- ***Maintenance Level 3:*** *Assigned to roads operated and maintained for travel by a prudent driver in a standard passenger car.*
- ***Maintenance Level 2:*** *Assigned to roads operated for use by high clearance vehicles.*

- ***Maintenance Level 1:*** *Assigned to intermittent service roads during time they are closed to vehicular traffic.*

Table II-1. Road Miles By Maintenance Levels

Maintenance Level	Surfacing	Lanes	Miles
5	Paved	2	35.8
5	Paved	1	21.4
5	Aggregate	2	6.6
5	Aggregate	1	19.2
4	Aggregate	2	12.3
4	Aggregate	1	196.9
3	Paved	2	1.5
3	Aggregate	2	2.4
3	Aggregate	1	427.8
3	Spot Aggregate	1	10.3
3	Native Soil	1	2.2
2	Aggregate	1	176.9
2	Spot Aggregate	1	58.9
2	Native Soil	1	80.5
		Total:	**1052.7**

Forest Highways and Scenic Byways: Roads under the jurisdiction of the state or other federal agencies provide a critical network of highways providing access to and within the National Forests. Many have been recognized as such with special designations that allow for additional funding.

Forest Highways are designated under the Public Lands Highways program of the Transportation Equity Act for the 21st Century (TEA21). Most of these routes on the Nantahala and Pisgah National Forests are state roads. Some are Forest Service roads. Once designated, they qualify for federal funding for improvement or enhancement. There are 57 designated Forest Highway routes totaling almost 550 miles. Forest Highway funding can be used for planning, design, and construction or reconstruction of these designated routes. Over the past 5 years, funding has averaged $1,394,000 per year. Emphasis has been on funding bridge replacements. In most cases the State then funds reconstruction of the road itself.

The National Scenic Byway Program <www.byways.org> was created as a part of the Intermodal Surface Transportation Act of 1991 (ISTEA) to recognize outstanding travel routes that celebrate the pride and diversity of our communities, as well as the stunning landscapes that have shaped our lives. A recognized road must also be considered a "destination unto itself". Once a road has been designated a State Scenic Byway, of which there are 17 in Western North Carolina, then it can be nominated as a National Scenic Byway or All-American Road, which then makes it eligible for funds to enhance the area adjacent to the road. The Blue Ridge Parkway (National Park Service jurisdiction) has been designated as one of only 15 All-American Roads. The Cherohala Skyway (State jurisdiction), running 17 miles through the Nantahala National Forest is one of 66 National Scenic Byways. In addition there are 2 Forest Service National Scenic Byways, the Forest Heritage Scenic Byway (79 miles) on the Pisgah District and the Mountain Waters Scenic Byway (61.3 miles) on the Highlands and Wayah Districts.

Meeting Forest Plan Objectives: In the Land and Resource Management Plan (LRMP) – Amendment 5, Appendix E – Outputs and Activities it states an average of 41.0 miles of construction/reconstruction of local roads and 0.0 miles of arterial or collector roads per year is expected to occur between 1986 and 2000.

Arterials and collector roads provide primary access to large portions of the national forest. Arterials normally serve as connections between towns, and state highways and are main thoroughfares through the Forest. Collectors link large areas of the Forest to arterials or other main highways. Local roads provide access to specific locations, such as a developed recreation site or harvest unit. A total of 289 miles (19.3 miles per year) of local roads were constructed and 1008 miles, including many collector roads, were reconstructed (67.2 miles per year) during the same15-year time period. It is difficult to relate the reported miles of reconstruction with expected outputs in the plan. Most reconstruction occurred as a result of storm damage, where the assumption in the plan did not include storm damage related activities.

Management Areas are used in the LRMP similar to zones in county or city plans. They are developed to document general direction and standards that can be used to achieve different desired conditions on large blocks of Forest Service land. There are 18 management areas, 5 general categories, and 13 site-specific areas designated. Emphasis for each category includes a description of the desired transportation system and guidelines for travel management.

For the five general categories an open road density is specified. Table II-2 illustrates that these standards are not always being met. In some cases they can never be met, even if all Forest Service roads are closed. This is because of the number of miles of road under other jurisdictions will remain open. More site or area specific direction and standards are also included in the LRMP, but should be addressed at the watershed and project scale.

All roads are classified by applying a 'traffic service level' to describe the road's significant traffic characteristics and operating conditions. Four levels are used; A-Free flow mixed traffic, B-Congested during heavy traffic, C-flow interrupted, use limited, and D-slow flow or may be blocked (refer to *Travel Routes – National Data Dictionary Roads* for more detailed descriptions). LRMP standards for Management Areas 1-4 state 'maintain all open Traffic Service Level C roads to a minimum maintenance level 3. Almost all the roads included in the NP RAP meet the desired minimum maintenance level. Those that do not are listed in Appendix B.

Table II-2. Road Density Compliance by Management Area

MA	Emphasis	Desired Open Road Density	Acres Exceeding Desired Open Road Density Includes all open Roads State & FS	Acres Exceeding Desired Open Road Density Includes only FS roads	Miles of Open Road needing closure to fully comply with LRMP standards	Acres Exceeding Desired Open Road Density Even if all FS Open Roads were closed
		Miles per Sq mile	Percent	Percent	Miles	Percent
1B	Provide motorized recreation use	2.0	21	21	17	0
2A	Provide motorized recreation use	2.0	60	36	42	16
2C	Provide motorized recreation use	2.0	48	18	26	34
3B	Close most roads to motorized use	0.5	51	25	79	21
4A	Close most roads to motorized use	0.25	70	38	26	44
4C	Close most roads to motorized use	0.25	38	21	34	18
4D	Close most roads to motorized use	0.25	64	47	85	30
5	Close all roads to motorized use	0.00	82	60	20	41

Budget

The overall condition of the forest's classified road system continues to deteriorate because the forest is not adequately funded to operate and maintain these roads to the level they were designed for. The forest receives only 25 % of what is needed for annual road maintenance and approximately $48 million is required to correct existing deferred maintenance needs.

Identifying Issues

3

Process

Issues can come from a variety of sources:

- Legal and regulatory language, and court decisions;
- Manual and Handbook direction;
- Forest Plan direction and standards;
- Members of the public, other agencies, and cooperators;
- Inventory and monitoring results;
- Knowledge of Forest Service resource specialists and managers.

Issues for the NP RAP came primarily from knowledgeable Forest managers and from publication FS-643, which was developed as a guide for implementing regulatory language and manual direction published in the Federal Register January 12, 2001. The search for issues remained open throughout the public involvement activities and in meetings with other agencies and cooperators.

From Forest Service managers and resource specialists, a list of 29 preliminary issues was developed. These issues are listed below.

1. Open roads that are not on the system
2. Stream crossings – sedimentation
3. Stream crossings – fish passage
4. Open road density
5. Fragmentation/Barriers
6. Wildlife mortality
7. American Indian traditional use access/reservation access
8. Roads paralleling streams\management area 18
9. Access for vegetation management, special forest products, fire control
10. Instability, cut slopes, fill slopes, road surface (low strength)
11. Opportunity for inventory of unclassified roads
12. Wildlife recreation access
13. Illegal hunting/poaching
14. Access to sensitive sites (TES)/use capacity of area
15. Invasive exotic species
16. Legal access to private land
17. Insufficient road maintenance
18. Road closure is not always the answer/feasibility of making a change
19. Easy access to favorite dispersed recreation sites and water
20. Adequate maintenance of highly used roads
21. Historic roads
22. Adverse impacts to archeological sites due to access
23. Drivability of a road (a loop or route)
24. Unroaded recreation opportunities complimentary to fragmentation reduction
25. Impact of road on recreation experience

26. Traditional use – prescriptive rights, access to cemeteries, etc.
27. Can we maintain the road where it is?
28. OHV – challenge of high clearance roads – maintain challenge/process of dealing with OHV driveways
29. Public safety/search and rescue

This list of 29 issues was then cross-walked with the 71 questions contained in FS-643, as a check. One preliminary issues was determined to be best addressed at the watershed or project scale (Issue #1). Likewise, several of the 71 questions from FS-643 were determined to be of low importance to the NP RAP, and more appropriately addressed in a watershed or project scale RAP. These will be noted in the discussion contained in Chapter IV.

Description of Issues

The issues and associated questions were organized into thirteen broad categories. A very brief description of each category follows. A more detailed description can be found in Chapter 4.

1. ***Ecosystem Functions and Processes.*** For the NP RAP, this category focuses on the risk of road construction introducing nonnative invasive species.

2. ***Aquatic, Riparian Zone, and Water Quality.*** This category encompasses ratings of watershed condition and vulnerability, the amount of roads near streams and the number of stream crossings in a particular watershed, and the condition of the aquatic animal populations.

3. ***Terrestrial Wildlife.*** Open roads provide land managers access to maintain wildlife habitat improvements such as grass/forb areas and orchards, and allow the public access for viewing and studying wildlife and for hunting. However traffic on roads also disturbs animals and can facilitate poaching and increase direct mortality (road kill). The NP LRMP sets the desired open road density for management areas, which is an important factor in wildlife habitat assessments and weighs into the risk factors assigned to roads. The importance of a road for maintaining wildlife improvements weighs in to assigning values.

4. ***Economics***. The cost to the agency for road maintenance is the major reason for Roads Analysis Process becoming a requirement for every national forest. On this Forest, we annually receive approximately one-sixth of the amount that is required to adequately maintain the transportation system. One desired outcome of the NP RAP was to find out if the limited maintenance dollars were going where the need was most critical.

5. ***Commodity Production: Timber, Minerals, Range, Water Production, and Special Forest Products***. Many NFS roads were originally constructed to provide access for commodity production, though they may serve other purposes

today. The current usefulness of a road for commodity production is factored into road values.

6. ***Special-use Permits***. Special uses are directly influenced by the road system. The special uses of a road are factored into assigning social value. Also, roads providing access to major special use facilities such as communication towers or utility corridors are noted in Appendix A.

7. ***General Public Transportation.*** Many Forest Service roads provide access to private property or are used as a link for commuters and the workplace. This factor was considered when assigning social values to roads. Also, roads providing access to private property are noted in Appendix A.

8. ***Administrative Uses***. Administrative uses of roads include providing access for research, inventory, and monitoring, for administrative offices. Roads providing access to administrative sites are noted in Appendix A.

9. ***Protection.*** For the NP RAP the main protection factors are values for fuels treatment and wildfire suppression, and risk for suppression. Protection in the sense of law enforcement and public safety are discussed under "General Public Transportation."

10. ***Recreation.*** Recreation is the main use of most open roads on the Forests. A value factor was assigned for every open road. Value was assigned based on amount and variety of uses, and the kinds of recreation sites accessed by the road.

11. ***Passive-Use Values***. These issues are more appropriately discussed at the watershed or project scale RAP, since they are directed at evaluating proposed actions.

12. ***Social Issues***. This is the most complex of issue categories. It includes an assessment of cultural, tribal, and historical sites, traditional uses of the Forests, wilderness values, and the social and economic health of adjacent communities. A social value factor was assigned for every open road. A risk factor was assigned to those roads where there is potential for significant archaeological sites to be impacted.

13. ***Civil Rights and Environmental Justice.*** If a road was associated with an impact to a low-income or minority group, that was considered a factor in assigning social value to the road.

Assessing Current Conditions

4

Introduction

Chapter 4 contains narrative answers to the questions contained in the document FS-643, Roads Analysis: Informing Decisions About Managing the National Forest Transportation System. In some cases the questions have been rephrased to be more applicable to Pisgah and Nantahala National Forests. Where appropriate, questions have been grouped together to facilitate a more coherent discussion of the relevant factors. The scope of the answer to each question is reflection of its relevance to the issues raised during the NP RAP, and its relevance to the Forest-wide scale of this analysis. Some questions are more appropriately answered at the watershed and/or project scale, and this is noted in the discussion.

In Chapter 4 there are references to road values, road risks, and the road ratings matrix. These references are in regard to value factors and risk factors assigned to individual roads, as a way of focusing future road maintenance needs and possible changes to the transportation system. A detailed discussion of the value and risk factors can be found in Chapter 5.

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?

Roading of currently unroaded areas was not identified as an issue in this Forest-scale RAP. This is because new system road construction is very low, actually declining to zero during FY 2001. Also, most roadless areas on the Forests are assigned to management areas that either prohibits road construction, or where road construction is unlikely. In addition, current regulations reserve authority for most road construction in roadless areas to either the Chief of the Forest Service or the Regional Forester. While not an issue for the Forest-scale RAP, this question may be identified as an issue for a watershed- or project-scale RAP.

Inventoried roadless areas contain important environmental values that warrant protection (Interim Directive No. 1920-2001-1). The Southern Appalachian Assessment (1996) identified roadless areas of the Forests. These are the unroaded portions of the Forests that could potentially lose their status as "roadless" if roading occurred. Roadless areas are places that have regained or are regaining a natural, untrammeled appearance; any signs of prior human activity are disappearing or being muted by natural forces (SAA, Social, Economic, Cultural Technical Report, pg. 177). Across the Forests there are approximately 152,400 acres in 32 identified roadless areas.

To determine what unique ecological attributes might be affected by roading currently unroaded areas, a query of the GIS database took place. This query sought to identify the overlap of roadless areas with special habitat features such as rock outcrops and vernal pools, designated old growth areas, and element occurrences of Threatened, Endangered (T&E), and sensitive species. For the purposes of this RAP, it is considered an environmental risk factor if these features are in close proximity to an open road.

Analysis indicates the following:

- Of 2,088 element occurrences of on the Forests, 201 sensitive species occurrences and 11 T&E occurrences are in roadless areas.
- Of approximately 236 special habitat areas, 25 occur in roadless areas.
- Of approximately 205,174 acres of designated old growth, 52,756 acres are in a roadless area.

From this analysis it is apparent that the unique ecological attribute most likely to be affected by roading a currently roadless area would be designated old growth. It is the one unique feature more likely to co-occur with the roadless condition. Whereas roadless areas make up only 15% of Forest acres, approximately one-third of the roadless acres are designated old growth.

Special habitats and known element occurrences of T&E and sensitive species are less common in roadless areas than across the remainder of the Forests, and so are less likely to be affected by road construction in roadless areas.

EF (2) & EF (3): 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? How does the road system affect ecological disturbance regimes in the area?

Non-native Invasive Plant Species (NIS plants)
Over 180 non-native (introduced) species have been recorded in an ongoing inventory of the Pisgah and Nantahala National Forests (Danley & Kauffman 2002). This represents more than 12% of the recorded flora. Only a few of these species have been found to be highly invasive within western North Carolina. A list of the most invasive species within the Pisgah and Nantahala National Forest lands includes the following plants: *Pueraria montana, Rosa multiflora, Microstegium vimineum, Ligustrum sinense, Lonicera japonica, Miscanthus sinensis, Celastrus orbiculata, Spiraea japonica, Ailanthus altissima, Paulownia tomentosa, Dioscorea oppositifolia, Glechoma hederacea, Rumex acetosella* and *Albizia julbrissin*. Other introduced species, such as *Vinca minor* or *Hedera helix*, while widely dispersed do not possess as invasive characteristics as those plants above and have less of an impact on plant communities.

Research in Florida suggests that roadways facilitate the transport of nonnative plant propagules to new sites (Greenberg, Crownover & Gordon 1997). This invasion by nonnative species tends to be enhanced in areas where roadside soils have been markedly modified. The influence of vegetation management practices in the road shoulders and cut and fill banks can have an impact on the land that extends far beyond its immediate range. NIS plants are considered a major threat to the integrity of native communities (White and Bratton 1980).

NIS plants tend to be more competitive and hold a reproductive advantage over native species (Bryson 1996). In many cases their natural enemies present in their native lands are not present here. The worst invasive species are capable of dispersing rapidly and producing copious amounts of propagules. Different invasive species sort out along a roadside edge based on exposure, elevation, and moisture gradients. For instance, *Microstegium vimineum* prefers moist soils, *Lonicera japonica* prefers moist with well-drained soils while *Paulownia tomentosa* prefers more xeric soils.

Preliminary occurrence data for some NIS plants have been recently compiled from field survey notes on the Nantahala and Pisgah National Forest. Over 1050 communities were recorded on the Nantahala and 220 on the Pisgah National Forest. The frequency of occurrence for *Microstegium vimineum* (present on 16% of the Nantahala sites, 12% of the Pisgah sites) is slightly higher than *Lonicera japonica* (present on 12% of the Nantahala sites, 10% of the Pisgah sites) across the Forest. Both species occur more frequently in mesic sites while *Lonicera japonica* has a greater tolerance for drier sites.

The greatest frequency of occurrence for these species were on sites less than 2500 feet in elevation.

In addition, a roadside NIS plants survey across 15 selected watersheds was completed in 2002 (Table IV-1). Three monitoring zones, the roadside edge, the edge/forest ecotone, and the interior forest, were surveyed for coverage of NIS plants. All the NIS plants were located within at least one of the watersheds. Of **558** plots analyzed **71%** had invasive exotic species present on the roadside edge. The ecotone and the forest interior provided less suitable habitat for these species. Invasive species were recorded within the ecotone of **51%** of the plots and within **18%** of the forest interior, which was defined as 100 feet from the forest edge. Generally, most of the species did not migrate to the forest interior. *Microstegium vimineum*, by far the most frequently encountered species on the road edge, was illustrative of most species. It was infrequently located within the forest interior even though it was densely covering the road shoulder, sometimes as much as 85%. Typically, when it was located in the forest interior it covered less than 5% of the forest floor. For those species that do not appear to persist in the forest interior roadsides populations probably only impact natural areas if they traverse open natural communities, such as serpentine barrens or grassy balds

Both monitoring data and anecdotal observations indicate that two species with only a limited distribution across the Nantahala and Pisgah National Forests have the potential to rapidly spread into the forest interior, particularly during periods of disturbance. Both *Celastrus orbiculata* and *Paulownia tomentosa have* been found to establish themselves in disturbed areas initially only to spread to relatively undisturbed forests (Konopik 2002. Roadsides can provide suitable habitat for these species to persist until ground disturbing, light enhancing environmental events result in the rapid dispersion of their small light seeds into the forest interior.

Table IV-1. Number of Non-Native Invasive Plant Species by Watershed

Watershed	Plot #	Road edge	Ecotone	Interior
Chattooga	23	20	11	0
Moses Creek/Sugar Ck	23	1	4	0
Ray Branch/ Cowee	40	15	2	0
Hiawassee	24	22	20	1
Valley River	41	26	19	1
Shellstand	41	24	9	0
Stecoah Gap	34	21	7	1
Armstrong Creek	33	24	25	18
Steels Creek	79	71	55	24
Parker Creek	49	46	33	10
Baldwin Gap	24	24	22	15
Big Ivy	32	20	11	4
Pigeon Roost	26	7	10	1
Hot Springs	39	29	24	15
Hurricane	50	45	35	13

EF (4): To what degree does the presence, type, and location of roads contribute to the control of insects, diseases, and parasites?

Due to the sporadic and unpredictable nature of insect and disease occurrences, and the Forest's limited ability to respond to infestations with effective control measures, this was not identified as an issue in the Forest-scale RAP. Even so, when established control measures for an insect, disease, or parasite can be applied from the ground (as opposed to an aerial application), the presence of roads could be a deciding factor as to whether or not treatment occurs on a particular site. For example, to fight the recent outbreak of southern pine beetle, the Forests decided to focus most control efforts on those infected areas that were within ¼ mile of an existing system road. This factor limited the possible treatment acres to 40% of the total acres susceptible to southern pine beetle. However the factors most limiting in the Forests' ability to treat were staffing, workload, and completion of required environmental analysis documents. So having more susceptible acres accessible from roads would not necessarily mean more infected acres would be treated.

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

The effects of road-related noise on the forest ecosystem were not identified as an issue for the NP RAP. First, the Forests do no anticipate developing many new roads. Second, the noise from road maintenance activities is infrequent and of short duration. Third, the traffic volumes on Forest Service roads (generally less than 100 vehicles per day) are not sufficient to create noise levels with deleterious effects that have been documented in situations of high traffic volumes of over 10,000 vehicles per day (Reijnen, et al, 1999). Roads with a lot of off-road vehicle traffic may have adverse effects on wildlife, since the noise from these vehicles tends to be of high amplitude.

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?

Roads have the potential of modifying the surface hydrology by reducing infiltration, generating more surface runoff and by concentrating that surface runoff. Surface runoff is commonly directed into stream channels via ditches or culverts instead of infiltrating over a large area or flowing slowly into streams as dispersed surface runoff.

Subsurface hydrology can be modified if the road intercepts the downslope movement soil water or groundwater. The intercepted slow moving subsurface water is changed into faster moving surface water.

The net result of both these potential effects is to reduce the time it takes for precipitation to enter the stream system. This can result in increased peak flow rates, shortened time from the onset of precipitation to the stream's peak flow, and reduced groundwater flow to the stream during non-storm periods.

AQ (1) is best addressed at the project-scale since the causal conditions are site-specific and the effects are generally localized. At the forest-scale only the potential risk of changes can be addressed. At the forest scale, risk of the road system modifying the surface and subsurface hydrology is estimated for the 6^{th}-HUCs using GIS coverages for watershed slope, and stream – road intersection density.

Forest-scale analysis using the above indicators showed that of the 143 6th-HUCs, 62 have low, 45 have an average potential, and 36 have a high potential of hydrologic modification due to roads. This comparison of 6th-HUCs is ONLY among those containing National Forest Land. Figure IV-1 presents a map of these results.

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

Any road surface that is not paved has the potential to erode. Most roads within the forest are either natural soil surface or aggregate surface (gravel). Due to funding limitations some previously aggregate roads are now mostly native surfacing. The existence and magnitude of surface erosion is highly dependent on site-specific conditions of road grade, design, surface material, traffic level, and maintenance level. Conditions within the road corridor, such as soil type, slope, and vegetative cover, are also major factors.

Generally paved roads under FS jurisdiction are only in high traffic public areas such as developed recreation and administrative sites.

AQ (2) is best addressed at the project-scale since the causal conditions are site-specific. At the forest-scale, the potential risk of road surface erosion can be estimated on a 6^{th}-HUCs basis.

The density of roads with either natural surface or aggregate surface was tested to estimate the risk of road surface erosion. However, due to the only slight differences in density, this indicator was discarded. The indicator for AQ (1) uses factors related to road erosion and is applicable to AQ (2).

The findings of AQ (1) are applicable to this question.

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

Roads have the potential of increasing mass wastage in those areas, which are prone to that condition. Mass wastage means a large movement of soil and or rock material due to gravity but often influenced by water. Conditions susceptible to mass wastage include steep land slope, bedrock bedded parallel to the slope, and shallow soils. Due to the complexities of the mountain topography, these conditions can vary widely within short road distances.

AQ (3) must be addressed at the project-scale since the magnitude of these potential effects is site-specific and cannot be meaningfully interpreted at a forest-scale.

AQ (4) & AQ (6): How and where do road crossings influence local stream channels and water quality? How and where is the road system "hydrologically connected" to the stream system? How do the connections affect water quality and quantity?

These two questions are closely related and use the same information to estimate potential risk. Hence they will be addressed together.

"Hydrologically connected" road segments are ones that deliver surface runoff directly to a stream channel. While this may occur at any point along a road, it is most common where roads cross-stream channels. This may be the result of inside ditches along the approach to the crossing or due to the actual crossing being a low point on the road at which surface runoff drains off.

There are several potential effects. First, for water quality, any pollutants in the surface runoff from the road such as sediment may degrade the stream water quality. Second, for stream peak flow rates and timing, can somewhat increase the peak flow rates by adding storm water runoff more quickly to the channel than normal potentially causing the peak to occur earlier in the precipitation event. Third, for water quantity, increased storm flow usually decreases the amount of precipitation that infiltrates to the soil or ground water system. This can mean shorter peak flow duration from storms and lower flow during non-storm periods.

Physically, increased peak flows can cause erosion of the stream channel resulting in deeper or wider channels. Material eroded will be deposited at some downstream location.

Note, however, that these potential effects are generally only observable locally for narrow roads. The risk increases with the amount of impervious surface "hydrologically connected" to the streams.

AQ (4) and AQ (6) are best addressed at the project-scale since the causal conditions are site-specific and the effects are generally localized. At the forest-scale only the potential risk of changes can be addressed.

Potential indicators of risk assessed at the forest-scale are average land slope derived from STATSGO information, density of roads within the 6^{th}-HUC and density of road-stream intersections within the 6^{th}-HUC. The individual rankings of these three indicators were averaged together and that average ranked. The 6^{th}-HUC with the lowest average rank (1) is assigned the highest potential risk of for road influence on local stream channels and water quality, and "hydrologic connectivity".

Forest-scale analysis using the above indicators showed that of the 143 6th-HUCs, 62 have lest potential, 45 have an average potential, and 36 have a highest potential of having road crossing of streams influence the local channel and water quality, or of having the road be "hydrologically connected" to the stream system. This comparison of 6th-HUCs is ONLY among those containing National Forest Land. Figure IV-2 presents a map of these results.

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

Roads can be a source of both point and non-point pollutants. Point sources would be primarily spills of materials transported on the roads, such as petroleum products and industrial or agricultural chemicals. Non-point pollutants would be primarily sediment from aggregate or natural surface roads, or dispersed chemicals unintentionally deposited on the traffic surface. Two other potential pollutants could be de-icing salt products and pesticides used to maintain the road right-of-way.

While all roads could potentially be a source of pollutants, open paved public roads (non-Forest Service) posed the greatest risk. These roads are the most likely to be used to transport various chemicals, experience spills from vehicle wrecks, use pesticides to maintain the road right-of-way and be treated with de-icing chemicals. Unpaved roads, in particular natural surface or aggregate surface interior forest roads pose the least risk due to lower traffic and maintenance needs.

AQ (5) is best addressed on a project scale with site-specific information about distance to streams, traffic levels and materials potentially transported on the roads.

The density of federal highways in each 6^{th}-HUC will be used to estimate the risk of potential effects of roadway pollutants. Risk will be assigned in three classes: low, average and high, each with an equal number of HUCs. High risk will be assigned to the 6^{th}-HUC with the greatest density of federal highways.

Forest-scale analysis using the above indicators showed that of the 143 6th-HUCs, 80 have low or no potential, 41 have an average potential, and 22 have a high potential of roads introducing chemical pollutants into streams. This comparison of 6th-HUCs is ONLY among those containing National Forest Land. Figure IV-3 presents a map of these results.

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?

Roads have the potential to impact downstream beneficial uses by changing water quality, quantity or timing to the extent it no longer meets the requisite standards. An example might be where roads increase water temperature through reduction of shading or heating surface runoff when precipitation hits hot pavement.

AQ (7) is best addressed at project scale since site-specific conditions are needed to predict what changes might occur. The majority of the mountain streams are fed by groundwater throughout their length so effects may be ameliorated as the point of interest moves further downstream. A third point is that the designated beneficial uses of the water are commonly different in different parts of the watershed.

The density of streams within each 6^{th}-HUC, with State designated uses of: WS water supply, B recreation, or C general waters with Tr trout, ORW outstanding resource water, HQW high quality waters modifiers, was used as an indicator of risk to beneficial uses. Risk is assigned in three classes: low, average and high. The three classes all contain the same number of 6^{th}-HUCs. 6^{th}-HUCs, with the greatest density of streams with beneficial use higher than C, are assigned a risk of high.

Forest-scale analysis using the above indicators showed that of the 143 6th-HUCs, 44 have fewest, 57 have an average number, and 42 have a highest density of downstream beneficial uses that could be at risk from road derived pollutants. Note that these beneficial uses are defined as those stream classifications that have a higher designated use than “C” waters. All fresh waters in the State are classified at least a “C”. This comparison of 6th-HUCs is ONLY among those containing National Forest Land. Figure IV-4 presents a map of these results.

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

Road have the potential to impact wetlands by changing the surface or subsurface hydrology that created and or maintains the wetland. For example if the wetland is maintained by surface stream runoff and that stream flow is directed away from the wetland by outletting the stream's culvert in a different location, the wetland could potentially dry up and convert to a more upland site. Conversely, the previously dry area into which the stream culvert is directed could become a wetland.

AQ (8) is best addressed at the project scale since site-specific conditions are needed to predict what changes might occur. These sites are typically small, commonly less than an acre is size.

No potential indicators of road effects on wetlands are known for use at a Forest-scale RAP when comparing 6^{th}-HUCs.

AQ (8) will not be addressed at the forest scale.

AQ (9): How does the road system alter physical channel dynamics, including isolation of floodplains, constraints on channel migrations, and the movement of large wood, fine organic matter, and sediment?

Roads can potentially alter the physical dynamics of a stream channel in several ways. The stream channel will be constrained at each crossing by the culvert of bridge installation. In this section the channel can no long migrate or change as it would naturally. Also the crossing may create hydraulics (width, depth, direction etc.) that are different than occurred naturally. During periods of peak or flood flows, the crossing may restrict flow so that the water backs up above the crossing causing more than normal flooding. This too may reduce the flow below the crossing preventing the stream from flooding its normal flood prone area.

AQ (9) is best addressed at the project-scale since the magnitude of potential effects is site-specific. At the forest-scale, risk can only be estimated on a 6^{th}-HUC basis by analyzing road-stream intersection density.

Figure IV-1.

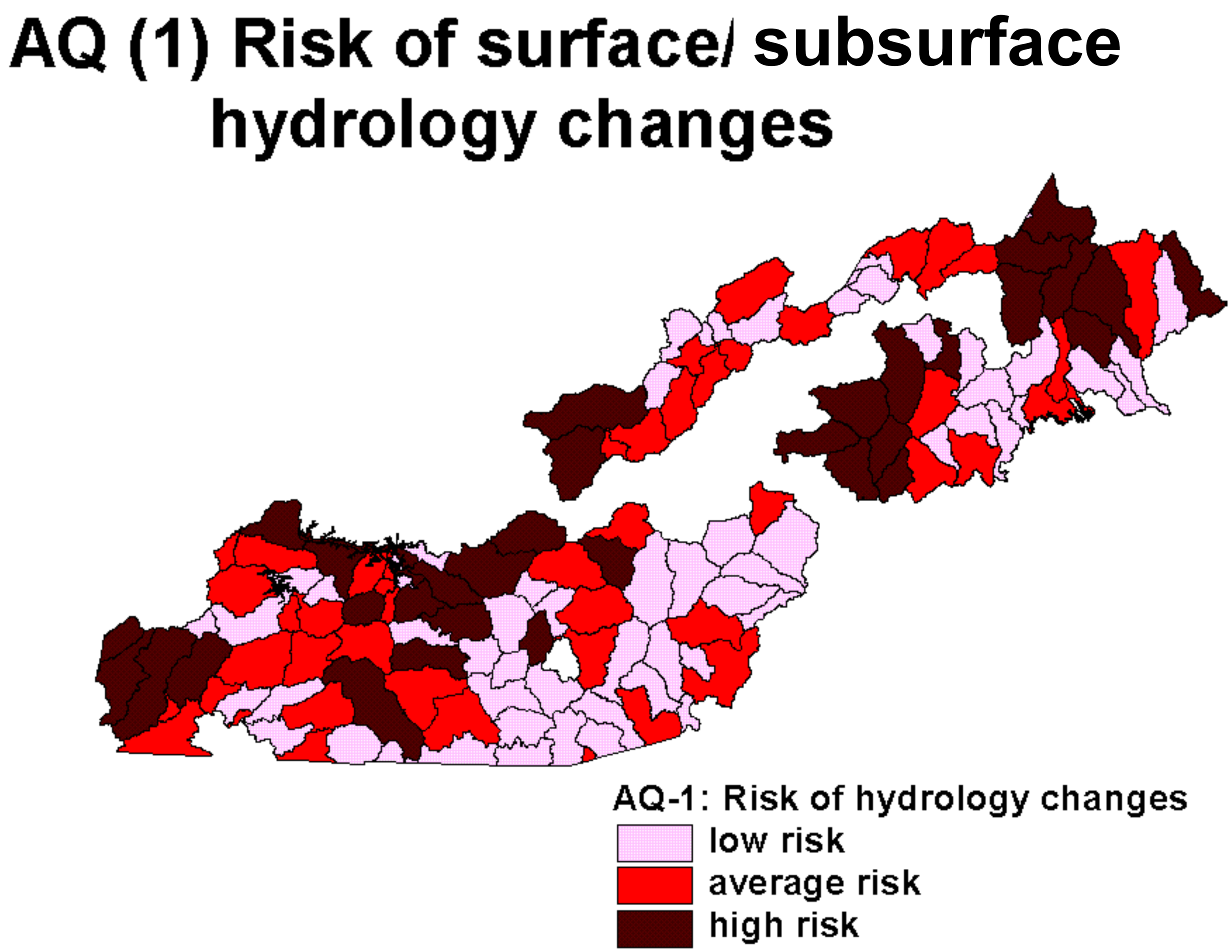

AQ (1) Risk of surface/ subsurface hydrology changes
AQ-1: Risk of hydrology changes
low risk
average risk
high risk

Figure IV-2

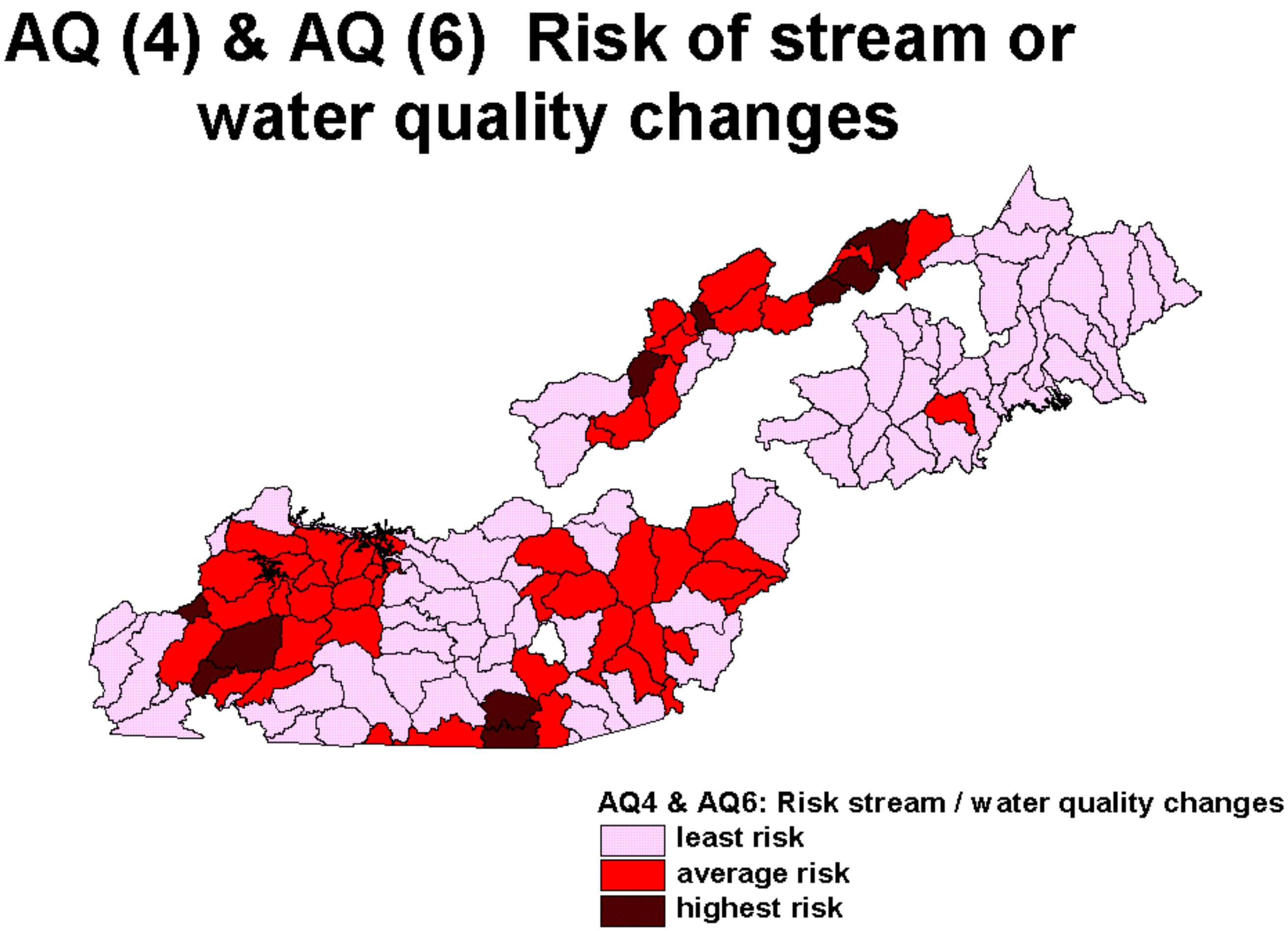

AQ (4) & AQ (6) Risk of stream or water quality changes
AQ4 & AQ6: Risk stream / water quality changes
least risk
average risk
highest risk

Figure IV-3.

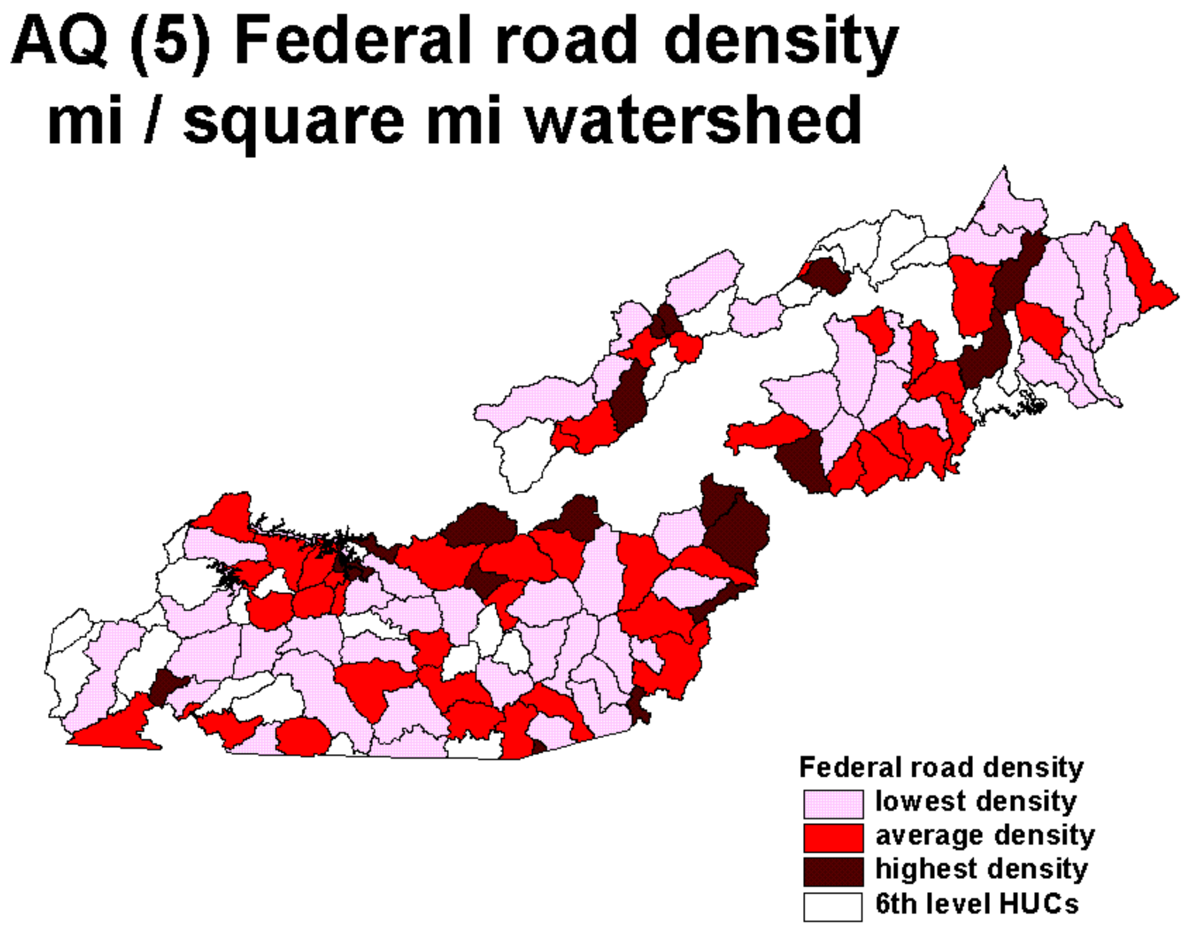
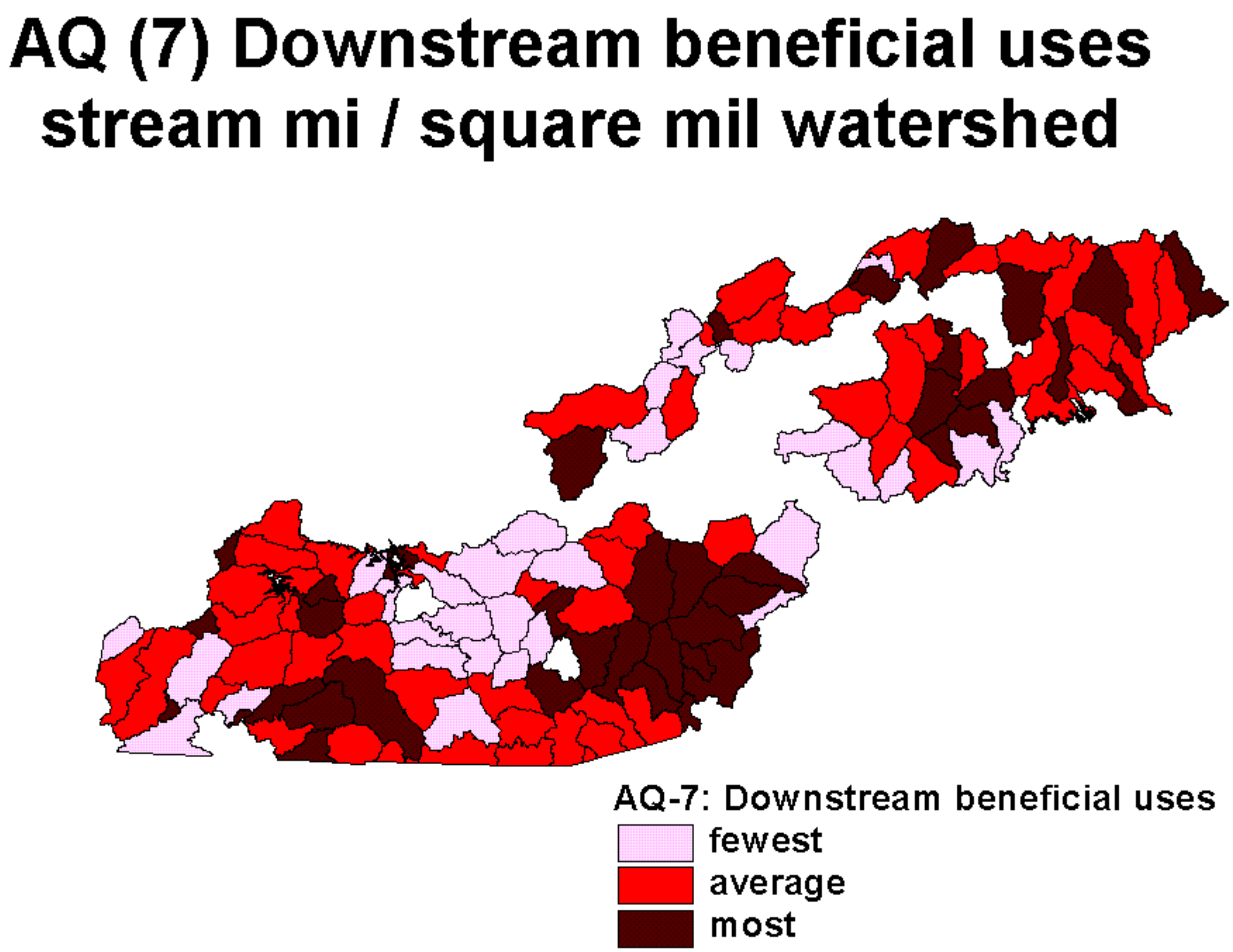

AQ (5) Federal road density
mi / square mi watershed
Federal road density
lowest density
average density
highest density
6th level HUCs

Figure IV-4.


AQ (7) Downstream beneficial uses
stream mi / square mil watershed
AQ-7: Downstream beneficial uses
fewest
average
most

AQ (10): (Part 1) How and where does the road system restrict the migration and movement of aquatic organisms?

Based on Forest stream modeling efforts, approximately 5,700 miles of stream flow through the Forests, with 42% of these miles supporting habitat for fish. It is important to note that first order streams (as defined by local models) do not support viable fish populations because they do not carry enough perennial flow to support multiple fish life stages and species. These habitats are, however, important sources of food, organic matter, and clean water for downstream fish populations. A greater percentage of stream miles supports habitat for aquatic invertebrates, but the relationship between low order streams and occupancy by aquatic invertebrates has not been determined on the Forests.

Across the Forests, there are approximately 8,800 intersections of roads and streams (on Forest Service lands), ranging from soil-based low-water fords to highly engineered bridges and culverts. It is widely accepted that these structures have varying effects on aquatic resources, particularly aquatic biota. Such effects include, but are not limited to direct loss of habitat at the site of the structure, limited downstream loss of habitat related to runoff and sediment control, and the potential for local alterations of stream hydrology (which affects local aquatic habitat quality and quantity).

Perhaps of greatest concern when discussing road and stream interactions is the potential to affect the migration and distribution of aquatic species. The issue of maintaining fish passage at stream crossings is not new, and is currently being intensively studied in all types of Eastern streams. Forest personnel are participating in this multi-region assessment of the effects of all types of stream crossings on resident fish communities. Results of this study will be available in late 2003.

In lieu of the pending results of this study, it is possible to use aquatic ecosystem modeling efforts from previous Forest analyses to determine potential effects of roads on migration of aquatic species.

In 1999, the National Forests in North Carolina classified streams within the Catawba River Basin (Pisgah National Forest) using three physical parameters: elevation (as a surrogate for water temperature), slope (stream gradient), and stream order (as a surrogate for stream size) in order to quantify habitat for mountain stream fishes. These parameters were selected based on habitat suitability models for brook, brown, and rainbow trout (Schmitt et al. 1993; Raleigh 1982; Raleigh et al. 1986; and Raleigh et al. 1984; respectively). They were also selected based on recent stream classification efforts in the southern Appalachian Mountains (i.e. Cherokee National Forest), and detailed analysis of GIS data for mountain streams in North Carolina.

One important result of this modeling exercise was that the fact that of the 26 observed changes in fish community structure, 21 (81%) are associated with a dramatic change in stream gradient. Field validation of where these changes in fish community occurred revealed that a change in gradient could be defined as natural obstruction such as a waterfall, but was more frequently associated with a road-stream intersection. And in particular, fish community changed most frequently at culverted crossings where the outlet was found to be “hanging”.

Therefore, based on the current assessment of stream crossings across the Forests (reference Appendix C for the number of crossings by 6th level HUC), it can be assumed that approximately 5,100 have the potential to restrict migration and movement of aquatic organisms (based on our knowledge of fish distribution by stream order). Until the results of the ongoing study to define actual effects of stream crossings on aquatic communities become available, it is reasonable to assume that if a project is proposed within a 6th level HUC containing a high number of stream crossings, that fish and other aquatic organism passage should be considered.

AQ (10): (PART 2) What species are affected, and to what extent?

When you consider that stream gradient (natural and artificial) appears to be playing a large role in defining aquatic community composition and areas where stream gradient is higher usually correlate with difficult stream crossings, it stands to reason that areas exhibiting higher stream gradients are where the potential for effects of road-stream intersections are greatest.

Approximately 5,100 (89%) of the stream miles on the Forests exhibit higher gradients (> 1%) and are considered to be coldwater systems (base on steam order and elevation), with approximately 58% (2,958 miles) supporting viable fish communities. Aquatic communities supported by this type of habitat include trout, trout/dace, and trout/other. The common thread throughout these fish community types is the presence of one or more trout species.

Trout are a highly mobile group of fish. Therefore, it is reasonable to assume that they would be affected by poorly placed or designed stream crossings. Appendix C displays the number of trout populations by 6th level HUC across the Forests.

The extent of the effects of roads on trout abundance and distribution across the Forests is not currently known. Until the results of the ongoing study to define effects of stream crossings on aquatic communities are available (expected late 2003), it is reasonable to assume that if a project is proposed within a 6th level HUC containing a high number of trout populations, that fish and other aquatic organism passage should be considered.

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

Roads have the potential of reducing stream shading, lowering litter fall and altering riparian plant communities primarily by eliminating the vegetative cover the would have existed on the road location. Changes in surface and subsurface hydrology as reflected by changes in soil moisture or ground water levels could also occur.

Generally, roads with major cleared corridors do not closely parallel streams in the analysis area. Also, leaf and needle litter can be transported considerable distance by wind unless its path is blocked by tall vegetation.

AQ (11) must be addressed at the project-scale analysis since the magnitude of these potential effects is site-specific.

AQ-11 will not be addressed at the forest-scale.

AQ (12): How and where does the road system contribute to fishing, poaching?

The open road system of the Nantahala and Pisgah National Forests provides free public access to angling for trout and other fish species. In addition, closed roads and trails also provide invaluable access (by foot) to more remote fishing opportunities across the Forests. As mentioned earlier, the Forests support approximately 3,306 miles of stream and river angling opportunities, ranging from high elevation trout fishing to large river bass, sunfish, catfish, and musky fishing. Several trout streams on the Forests have received national and international recognition. Medium-sized rivers across the Forests are a destination for local and regional smallmouth bass and musky anglers.

Given that the Forests are the largest block of public lands in western North Carolina, it is reasonable to assume that the Forests' road network is the primary access to aquatic resources and angling opportunities. It is also reasonable to assume that where this access is closest to the resources, it contributes the most to fishing (and on the negative side, poaching) on the Forests.

Appendix C displays the miles of road adjacent to streams or rivers by 6th level HUC across the Forests. It is important to note that while the proximity of this road mileage to streams and rivers improves angler access, it also poses a threat to water and aquatic habitat quality across the Forests. Despite our ability to display where access is potentially the best, the extent of the effects of roads on fishing and poaching is best assessed at the project scale, where local knowledge of angler habits and preferences is more extensive.

AQ (12) & AQ (14): How and where does the road system contribute to direct habitat loss for at-risk species? To what extent does the road system overlap with areas of exceptionally high aquatic diversity or productivity or areas containing rare or unique species or species of interest?

These issues are partially addressed in the assessment of potential effects or roads on rare species and habitats (TW 4). In the mountains of North Carolina, the areas of highest aquatic diversity are the large rivers, where there is little Forest Service ownership.

When considering the occurrence and distribution of rare aquatic species across the Forests, several distinct clusters of element occurrences (EOs) appear. These areas are associated with large rivers such as the French Broad, Little Tennessee, Hiwassee, and

Nolichucky Rivers. Again, there is little Forest Service ownership directly adjacent to these areas. However, large rivers often have roads paralleling them, and there are Forest Service roads included here. Potential effects to aquatic species (including rare and unique species) are examined in the analysis described for AQ10, but are perhaps best addressed at the project scale.

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

The most vulnerable areas to the introduction of non-native aquatic species are at boating access points across the Forests. These include not only highly developed boat ramps, but also canoe and raft trails. These are all areas where our open road system provides access.

While the introduction of non-native aquatic species has been minimized in the North Carolina mountains (mainly due to strict interstate regulation of professional and semi-professional angler boat washing and species eradication implemented by the TVA and other resource agencies), the increasing popularity of the area for large river and reservoir angling increases the risk that such outbreaks will occur. This risk is the greatest at the highly developed boating access areas, where anglers travel from state to state in search the best fishing. Several reservoirs in the North Carolina mountains also host professional angling tournaments, where anglers come from all over the country (and world). Identification of specific threats is best done at the project scale, where local boating use patterns are better understood.

AQ (biota) overview:

To assess overall vulnerability of aquatic biota to effects from open roads across the Forests, several parameters were used as indicators or potential threats to and risk of detrimental effects to aquatic resource health (by 6^{th} level HUC). These included:

1. miles of stream within the watershed,
2. miles of road paralleling (within 100 feet) a stream,
3. percent of the road network paralleling streams,
4. number of stream crossings (all types),
5. number of trout populations,
6. percent of the trout populations equal to brook trout (native), and
7. number of rare aquatic species occurrences.

Statistical analysis revealed that of the seven parameters initially considered, four were influencing overall vulnerability of aquatic biota to effects from open roads:

1. **percent of the road network paralleling streams,**
2. **number of stream crossings (all types),**
3. **number of trout populations, and**
4. **percent of the trout populations equal to brook trout (native),**

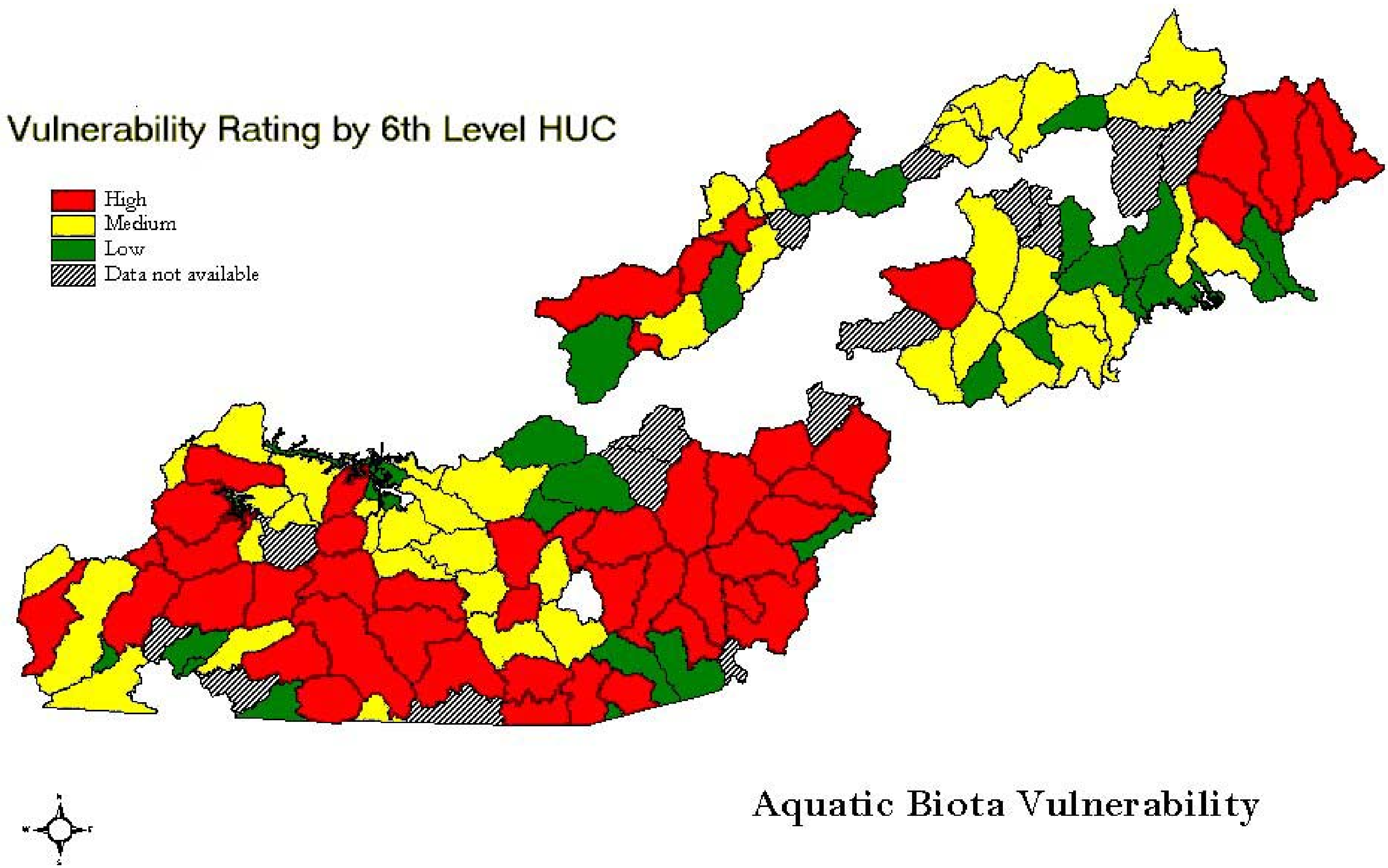
Values of each of these parameters were determined by 6th level HUC across the Nantahala and Pisgah National Forests (reference Appendix C). To determine overall vulnerability, the range of values for each parameter were ordered and assigned a risk rating of 0 if the value was in the first quartile, 1 if the value fell within the interquartile range, and 2 if the value was in the fourth quartile. The individual vulnerability ratings were then summed by 6th level HUC to determine overall vulnerability of aquatic biota within the HUC to the effects of open roads (reference Appendix C).

Based on this analysis, aquatic biota within 23% of the 6th level HUCs across the Forests exhibit a high vulnerability to effects from open roads. Aquatic biota within approximately 47% of the 6th level HUCs exhibit moderate vulnerability to effects of open roads, and aquatic biota within approximately 30% of the 6th level HUCs exhibit low vulnerability to effects from open roads. The distribution of these aquatic biota vulnerability ratings is displayed in Figure IV-5.

A separate, road specific analysis was performed to assign individual open roads an aquatic biota vulnerability rating. The same four factors were used:

1. percent of the road paralleling streams,
2. number of stream crossings (all types),
3. presence of trout populations, and
4. presence of the brook trout.

Figure IV-5.


Vulnerability Rating by 6th Level HUC
High
Medium
Low
Data not available
Aquatic Biota Vulnerability

Terrestrial Wildlife (TW)

TW (1),TW (2), TW (3), TW (5) : What are the direct effects of the road system on terrestrial species habitat? How does the road system facilitate human activities that affect habitat? How does the road system affect legal and illegal human activities? What are the effects on wildlife species? How does the road system directly affect species (road kill)?

The effect of the road system on wildlife was identified as an issue in this Forest-scale RAP. Reasons for this include:

- The density of open roads may affect the safety and security of certain species such as black bear. In estimating suitable habitat for black bear, open road density is one of several factors considered (Final Supplement to the FEIS, Land and Resources Management Plan Amendment 5, Nantahala and Pisgah National Forests, February 1994, pg. III-5). The LRMP for Forests contains standards for open road densities that vary according to the types of uses emphasized in the different management areas. The open road density standard varies from 0.25 miles or less of open road per square mile of Forest in some areas that emphasize little or no human activity, to 2 miles per square mile in areas where motorized recreation is emphasized. For some management areas, no open road density standard is set.
- Roads can provide access to maintain desired wildlife habitat features such as grass/forb fields. Numerous areas across the Forests are maintained as open fields for those species that need herbaceous vegetation or that feed on the insects found in herbaceous vegetation. The North Carolina Wildlife Resources Commission maintains many of these areas. While open roads provide access to maintain these fields, closed roads are in many cases ideal for converting to strips of desirable herbaceous vegetation known as "linear wildlife openings."
- Open roads can be used by hunters to access hunting opportunities. However, poachers may also use them

The greatest direct effect of roads on wildlife occurs from paved roads where vehicle speeds tend to be higher than on gravel roads, so animals are less likely to move out of the way quickly enough. Road kill is not a significant direct effect of the open road system since almost all FS roads on the Forests are not paved. Most road kill is associated with state roads with higher traffic volumes and speeds. This could be an issue for a specific road-related project if paving is a part of the proposed action.

Habitat fragmentation can also affect wildlife. Narrow gravel roads with tree canopies extending over the road are less likely to fragment habitat than multi-lane highways such as state or federal highways and interstates. Habitat fragmentation may be more appropriately considered as issues for a particular watershed or project roads analysis if these wider, more heavily traveled roads are in the analysis area.

In assigning values to open Forest roads, the use of the road to provide hunting access and wildlife management is considered. Likewise, in assigning risks to the roads, the open road density, the use of the road by poachers, and other wildlife impacts were considered. Information regarding these factors was collected at the District meetings, and through GIS analysis. GIS analysis was used to determine open-road density for all areas of the Forests. This open-road density calculation included all open roads: those under Forest Service jurisdiction as well as state roads and federal highways. Then, by overlaying management area boundaries, it could be determined where there are areas with very excessive open road densities. The density categories were determined from management area standards and are as follows:

1. 0
2. Greater than 0 and less than or equal to 0.25 mi/mi^2;
3. Greater than 0.25 and less than or equal to 0.5 $mi/mi^{2;}$
4. Greater than 0.50 and less than or equal to 1.0 mi/mi^2
5. Greater than 1.0 and less than or equal to 2.0 mi/ml^2
6. Greater than 2.0 mi/mi^2

Several factors influenced the accuracy of this analysis. First, the GIS coverage of management area boundaries was developed from 1994 planning maps where wide markers were used to delineate management areas on USGS quadrangle maps. As a result, management area boundaries that were meant to follow roads are sometimes offset from the location of the road, leading to calculation errors. Another factor deals with situations were a road forms the boundary between two management areas. These road miles may have been attributed to both management area polygons, or double counted. This accounts for management area blocks showing an open road density greater than zero, even though no open roads are inside the polygon, only bordering the polygon.

Table IV-2. Open Road Density by Management Area

Management Area ⟶ (desired road miles per sq. mile)	**MA1 (2)**	**MA2 (2)**	**MA3 (0.5)**	**MA4 (0.25)**	**MA5,6,7 (0)**
% of acres at or below the desired open road density	79%	60%	49%	23%	41%
% of acres one density category higher than desired	21%	40%	30%	34%	53%
% of acres greater than one density categories higher than desired	n.a	n.a.	21%	43%	6%

From Table IV-2 it is clear that the greatest gap between desired and actual open-road density is with Management Areas 4.

Certain areas of very excessive open road density are of special concern to wildlife biologists due to their proximity to bear sanctuaries Also, MA 4s are of concern since these management areas are set up to emphasize a remote setting with few motorized vehicles and high quality wildlife habitat. However, the wildlife species of most concern in this regard have populations that are generally stable or increasing, so there is no indication that these higher-than-desirable open road densities are negatively affecting the wildlife populations across the Forests. This could change in the future as more people come to reside in the adjacent privately owned forests.

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

The road system may facilitate introduction of non-native invasive species that could affect unique communities or special features. This topic is addressed in question EF(2). In addition, open roads may facilitate human activities that could have a deleterious impact. People are often drawn to unique areas or special features, and proximity to a road allows for better access by more people. Impacts could come from disturbance of a site, such as rock climbers using rock outcrops. Or, impacts may come directly, such as people collecting rare species. Forest-wide, the proximity of a road to a rare species or special habitat was considered as a factor in assigning risks to roads. This is also a question that may need to be considered for a watershed or project-scale RAP.

Economics (EC)

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

Direct costs of the road system as it is managed today include an average annual expenditure per year of just over $2 million. Hidden costs include the increase in deferred maintenance that occurs each year due to inadequate funds necessary to address all annual maintenance needs (estimated at $7.4 million per year). The backlog of road maintenance needed to bring the system back to the standard specified in road management objectives is $48.7 million.

Most of the arterial/collector system has been in place for at least 50 years. While funding has decreased sharply, traffic levels have increased. It is expected that the demand for use of the national forests will continue to increase dramatically in the future. The Forest Service is proposing to designate most of the arterial/collector system as public roads as defined in 23 U.S.C. 101. Nationally, road condition surveys have identified a need for $4.3 billion to reconstruct these designated Public Forest Service Roads (PFSRs). The need for the top 22 priorities for the Nantahala and Pisgah National Forests has been estimated at $25.7 million and represents what could be accomplished in 6 years under a national program funded at $400 million per year.

Top Reconstruction Priorities:

District	Road Number	Road Name	Length
Wayah	711	Winespring	15.10
Toecane	472	South Toe River	4.00
Cheoah	423	Tatham Gap 1	5.30
Tusquitee	423	Tatham Gap 2	3.60
Grandfather	210	Roses Creek	14.40
Pisgah	475	Davidson River	3.60
Highlands	1178	Bull Pen	4.80
Pisgah	1206	Yellow Gap	13.10
Tusquitee	420	Davis Creek	3.20
Toecane	235	Pigeon Roost	3.50
Cheoah	520A	Cable Cove RA	0.40
Cheoah	81	Upper Santeetlah	10.63
Wayah	67	Upper Nantahala	11.80
Grandfather	210B	Rich Cove Spur	1.60
Pisgah	479	Bent Creek	6.10
Highlands	401	Rich Gap	4.40
Tusquitee	340	Fires Creek	5.45
Tusquitee	340	Fires Creek	6.95
French Broad	148	Cold Springs	6.30
Grandfather	482	Curtis Creek	7.50
Cheoah	75	Snowbird	4.10
Wayah	437	Rainbow Springs	4.60

The major categories of revenue generated on the Nantahala and Pisgah Forests for FY2001 include:

• Timber & Special Forest Product Permits	$ 433,000
• Land Uses	$ 128,000
• Minerals	$ 19,000
• Power	$ 17,000
• Recreation special use & fees	$ 102,000
• K-V	$ 310,000
• Timber Purchaser Road Credits	$ 211,000
• Recreation Fee-Demo	$ 1,531,000
• Granger-Thye Collections (approximate)	$ 200,000
	$ 2,951,000

Costs of performing road activities are well documented and can be applied to individual projects fairly accurately. These figures can even be used to calculate costs for transportation planning at most scales. However, the increases in revenue that can be expected from expending these moneys can only be accurately portrayed at the project scale.

At the forest scale this question can only be answered in broad terms. Because funding has been and probably will continue to be inadequate, one objective of this analysis was to determine where to invest these limited funds to maximize benefits and the ability to meet existing and future land management needs. This analysis does not come up with actual increased revenue attributed to the investment made in the road system, but does make an attempt to ensure that the increase is maximized.

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

Optimizing roads includes decisions to build new roads, rebuild or otherwise improve existing roads, or remove roads from the network. The basic economic principle of selecting road activities that provide the most desirable change per unit cost can be useful in making effective road decisions, however these decisions are best made at the project or watershed scale where more detailed information can be acquired for roads accessing a particular area.

Attempts have been made in the past to generate answers to this question, most notably in TSPIRS for roadwork accomplished through the timber sale program. The analysis done for the 1998 TSPIRS report for the National Forests in North Carolina stated that the present net value of harvesting 4592 acres, including wildlife benefits, was $1.3 million after subtracting road costs of $1.1 million for construction, reconstruction, and maintenance. However the analysis is too limited in scope to adequately answer the question.

Another method at deriving benefits attributable to road expenditures is displayed in the Public Forest Service Roads Report dated December 15, 2000, and found at the following web site. <http://fsweb.wo.fs.fed.us/eng/programs/trans/resource_paper.pdf>. Nationally, it is estimated that with a $400 million per year program, benefits would include:

• Change in recreation total income:	+4.9 billion
• Recreation jobs made available:	+117,000
• Sediment reduction:	3.6 million cubic yards
• Lives saved per year	87
• Traffic Accidents reduced	4180
• Savings in Lives and Injuries	$473 million

The Forest 6-year program represents 1% of the national program. Although a direct correlation between national benefits and forest benefits cannot be made, it is apparent that the benefits of investing these funds in reconstruction would be significant.

Costs for construction, maintenance, operation and obliteration are well documented. It is the non-monetary costs that result from road management decisions, such as sedimentation of fish habitat, fragmentation of species habitat and loss of ORV opportunities that can only be addressed at a more local level with adequate public involvement.

Assigning dollar values for most of the benefits of a transportation system, other than timber harvesting and some recreational uses is hard to derive. In most cases it depends on a more specific area of analysis than forest-scale. During watershed and project scale analysis, some of the benefits that will need to be addressed include:

- Passive-use values – things, places, or conditions people value simply because they exist, without any intent or expectation of their using them, for example roadless areas or landscapes with unique characteristics. Building new roads into these areas can negatively affect the value of the area, and obliterating roads may increase value. Because dollar figures are impossible to assign, adequate efforts must be made to solicit public involvement at the appropriate level for a clear picture of the tradeoffs being considered.

- Heritage and Cultural values – many roads and road features in Western North Carolina have historic significance, including many constructed by the Civilian Conservation Corps and historic paths such as the Trail of Tears. Many roads are adjacent to and their management can result in significant affects on historical and archaeological sites. Decisions should be made on an individual basis for roads that impact these values.

EC (3): How does the road system affect the distribution of benefits and costs among affected people, primarily in the local communities?

Road availability and quality affect how much users access the forest and where they go. Links between communities affect how benefits attributed to use of Forest Land are distributed beyond the immediate area of activity. For the most part, all of western North Carolina has an excellent State Primary and Secondary Road system linking communities. In many cases Forest Service roads provide critical connections that compliment the State's transportation system. Costs associated with the Forest Service Road System are minor compared to those attributed to the State system.

In the seventeen counties in Western North Carolina, especially in those with a large percentage of public land ownership, the Forest Service transportation system provides the necessary access for much if not most of the economic stimulus in the county, without the accompanying costs to the county of maintaining the system. Unlike most states, counties in North Carolina do not have the added burden of trying to finance a portion of the costs of a county system of roads through property taxes.

Both benefits and costs are associated with building, maintaining, and use of Forest Service roads. Likewise, benefits and costs are associated with removing existing roads. Analyses for the 1995 RPA Program suggests that about 33 jobs economy wide (nationally) are supported per $1 million expenditure on building and maintaining roads. The same assumptions can probably be made about removing roads and restoring the landscape. Road building and removal represent a one-time stimuli to the economy, but maintaining roads is a recurring stimulus. The average $2 million expenditure each year for the Nantahala and Pisgah National Forest roads program thus translates into approximately 66 jobs.

Forest Service roads support activities including logging, silvicultural operations, recreation, fishing, hunting, firefighting and other land management practices. The 1998 Timber Sale Program Information Reporting System (TSPIRS) indicates that timber harvest in North Carolina supports about 23 jobs per million board feet. At the current annual volume of 10 MMBF this translates to 230 jobs with an approximate payroll of $18.8 million.

Almost all recreation use on National Forests depends to some degree on road access. Altering road systems can disrupt long-established access and use patterns. Less road mileage, maintenance, or both can lead to uneven shifts in recreation opportunities among various user groups and directly affect the distribution of economic benefits in a region. A National Visitor Use Monitoring (NVUM) project was conducted during FY2002 on the National Forests in North Carolina (including the Uwharrie and Croatan National Forests). Annual recreation use included 4.6 million visits, 6.3 million site visits, and 0.2 million wilderness visits. The top priority activities were hiking/walking, driving for pleasure, viewing natural features, fishing, and relaxing. Forty-one (41) percent of those interviewed stated that driving for pleasure was one of the activities they participated in. One hundred and forty-nine (149) were interviewed on 'satisfaction'. On average they stated that road condition is an important factor and 94% rated the condition as good to very good. This would indicate that the benefits of increasing annual road maintenance dollars to increase user satisfaction and by association increase economic benefits would be marginal.

In a typical year, visitors to this forest spent an average of $1473 on all outdoor recreation activities including equipment, recreation trips, and licenses.

Wildfires can have a costly and devastating impact on local economies. Improved road access leads to increased efficiency and effectiveness of fire-suppression activities, but at the same time can contribute to increased frequency of human-caused ignitions in an area. Closing or restricting roads to minimize traffic has both the benefit of reducing ignitions and of maintaining the road in a condition that facilitates use by fire fighting equipment. Improving the condition of the open road system would have, at best a minimum impact on reducing risk and costs of wildfires.

Harvesting of special forest products such as firewood, ginseng, moss, galax, herbs and other medicinal, botanicals, decorative, and natural foods are dependent on access by Forest roads. Particularly for the local harvesters, who often have low-income, access by road to the resource becomes a critical cost factor. In this study, critical roads that are known to provide access for the harvesting the products allowed by approximately 2000 permits per year have been identified and considered in assigning road values.

The actual dollar values associated with the distribution of benefits and costs among affected people needs to be addressed in project or watershed scale RAPs.

Commodity Production: Timber (TM), Minerals (MM), Range (RM), Water Production (WP), Special Forest Products (SP)

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

Logging systems generally require moving logs from the stump to a truck. For helicopter logging, flight distance should not exceed one mile to the nearest truck road. For ground skidding and cable logging, a truck road must be within one-quarter mile of the area being harvested to reduce skidding or forwarding time. However, these truck roads may be managed as closed to motorized vehicles between periods of active logging.

TM (2): How does the road system affect managing the suitable timber base and other lands?

Suitable timber classification infers that commercial logging or other vegetation treatments can be performed economically. Stands within the suitable base must be accessible according to the guidelines described in TM (3).

TM (3): How does the road system affect access to timber stands needing silvicultural treatment?

Access to stands needing silvicultural treatments must be reasonable, e.g. getting people and equipment to the stand should not be cost prohibitive. Roads are often needed in hilly or mountainous terrain to reduce potential erosion caused by traversing across or up and down slopes, resulting in exposure of mineral soil. If equipment such as chainsaws, gas, or tree seedlings have to be carried in by foot for distances beyond one-quarter mile, labor costs escalate significantly. Roads used for these purposes need to accommodate vehicles, but they do not have to remain open to the public.

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

Some special forest products can be collected in remote areas and carried out on foot or using wagons or wheelbarrows. But as quantities become larger, or for heavy items such as dug plants and firewood, open roads are needed to make gathering feasible. Generally speaking, most removal of special forest products occurs within one-half mile of open roads.

American Indians as well as other ethnic groups access traditional gathering and collecting areas by open Forest roads. Not all resources, especially those becoming increasing rare (river cane), are easily accessed.

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

All Forest Service land in North Carolina has been obtained under special circumstances such as purchase, exchange, condemnation, or donation. As such they are termed 'Acquired Lands' and are open to prospecting and leasing under the Acquired Lands Leasing Act of 1947, as amended (30 U.S.C. 351-359) and Section 402, Reorganization Plan No. 3 of 1946 (60 Stat. 1099).

Primary management responsibility for the Federal mineral estate rests with the Bureau of Land Management. However, when the lands are "acquired" and the surface is managed by the Forest Service, the Forest Service must give its consent for any mineral exploration and development activity. The Forest Service must determine whether such activities are compatible with the purpose for which the land was acquired.

Access to claims is addressed on an individual basis and such access may be closed to the general public. Most roads constructed into mining claims are temporary. Where reconstruction, construction and reclamation are necessary for access, bonding is required as part of Operating Plans or Notice of Intent. Existing arterial and collector roads are utilized to access the general area and are sufficient for that purpose. Transportation plans are generally developed as part of each minerals activity requiring access. There are currently no leaseable minerals actively being pursued on the Nantahala or Pisgah National Forests.

There are, under section 4 of the 'Preference Right Lease or Mineral Materials Permit' several requirements the permittee must agree to. The permittee shall fully and currently repair all damage, other than ordinary wear and tear, to national forest or project roads caused by the exercising the privileges of the permit. No transportation of mineral materials shall be permitted on roads until drainage acceptable to the Forest Service is installed. The Forest Service shall have the right to use any road constructed by the lessee. Roads constructed by the permittee may be used by other parties in connection with other authorized uses of national forest (they shall pay their share of maintenance costs).

Additionally, regulations require that roads needed for mineral activities shall be constructed and maintained to minimize or eliminate damage to resource values (including wildlife). Unless otherwise authorized, roads that are no longer needed for operations shall be closed to normal traffic, bridges and culverts removed, and the road surface shaped to as near a natural contour as practicable and stabilized. The existing road system has been sufficient to meet locatable requests to date

Salable Minerals include mineral materials, otherwise known as "common varieties" which generally include deposits of sand, gravel, clay, rock or stone used for a number of purposes including road surfacing, construction materials, and landscaping. The disposal of these materials is by a materials contract issued at the discretion of the Forest Service. All contracts contain requirements for reclaiming the sites, as much as practicable, to pre-mining conditions. Existing arterial and collector roads are sufficient to gain access to the general area of salable proposals. The value of salable common variety minerals is very sensitive to transportation costs.

The Forest Service has total discretionary authority for disposal of common variety minerals and is not obligated by any statutory requirements. There are several gravel and stone mines on the Pisgah and Nantahala National Forests that are an important source of local income and building material. They are accessed by local roads built and maintained by the permittee and are closed to the general public.

Leaseable Minerals are federally owned fossil fuels (oil, gas, coal, oil shale, etc), geothermal resources, sulfur, phosphates, and uranium. The Forest Supervisor has consented to lease the Federal oil and gas rights underlying the Pisgah and Nantahala National Forests. Exceptions include a ½ mile strip along the Chattooga Wild and Scenic River withdrawn by Congress and possibly areas under wilderness areas, Experimental Forests, and municipal watersheds under authority of the Chief of the Forest Service. Road access for leased mineral rights is generally planned and developed on an individual basis. Production of lease mineral rights will require some high-standard haul roads. There are no leaseable mineral rights currently active or planned in the foreseeable future on the Pisgah or Nantahala National Forests.

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

The range program on the Forests is insufficient for this to be an issue. The only grazing is by sheep on Roan Mountain for the purpose of maintaining the balds. Primary access to Roan Mountain is by state roads.

WP (1), WP (3) How does the road system affect access, construction, maintaining, monitoring and operating water diversions, impoundments, and distribution canals or pipes? How does the road system affect access to hydroelectric power generation?

Road systems located on National Forest System lands directly influence the management of all Special Use permits (approximately 1,400) to access, construct and maintain privately owned lands/facilities on or adjacent to the forest. Permitted include the operation of septic systems, water diversions for public water systems, hydroelectric power generation, wastewater treatment plants, etc.

The following are examples of several uses as referenced above:

WP (1): National Forest system roads access numerous facilities that provide water to include the Pisgah Trout Hatchery operated by the North Carolina Wildlife Resource Commission, Town of Murphy Sewage treatment plant, along with numerous private and public water systems.

WP (3): Specific to hydroelectric power generation; forest road systems provides the only access to the Nantahala Dam, owned by Duke Power Company. This facility generates 50 Mhw of power and provides recreational river flows to the Nantahala River and in turn, serves as the major employer of Swain County with 29 commercial outfitters that are permitted to use NFS lands.

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

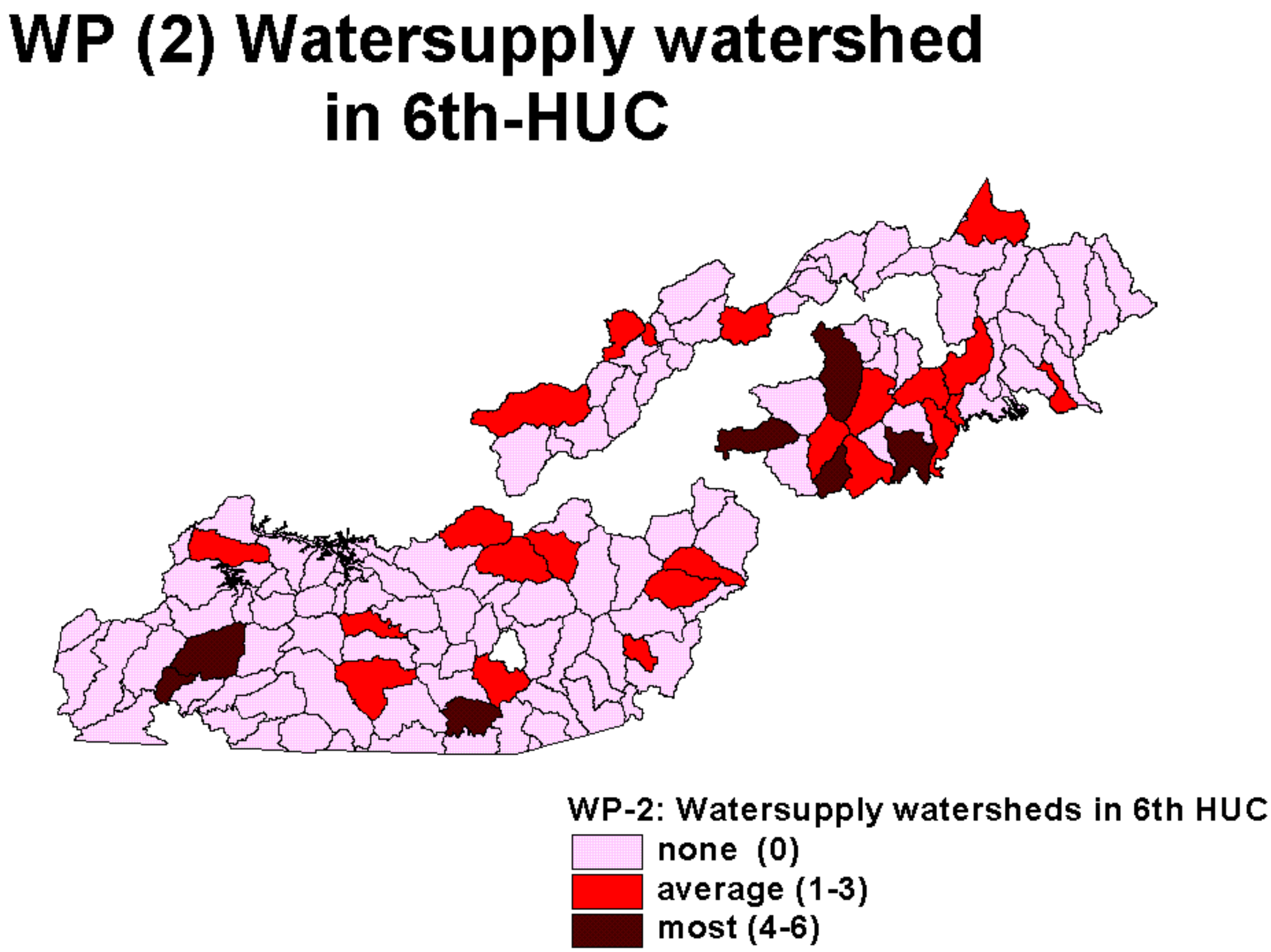
Roads can be a source of both point and non-point pollutants. Point sources would be primarily spills of materials transported on the roads, such as petroleum products and industrial or agricultural chemicals. Non-point pollutants would be primarily sediment from aggregate or natural surface roads, or dispersed chemicals unintentionally deposited on the traffic surface. Two other potential pollutants could be de-icing salt products and pesticides used to maintain the road right-of-way.

WP (2) is best addressed at the project level scale since site-specific conditions are needed to estimate potential risk. Forest level scale analysis can estimate relative risks between 6th-HUCs.

The primary indicator of risk is the number of municipal watersheds within each 6th-HUC.

Of the 143 6th-HUCs analyzed, only 7 have a high risk of roads affecting water quality in municipal watersheds. These 7 6th-HUCs have four to six municipal watersheds within their boundaries. Average risk is assigned to 23 6th-HUCs, which have one to three municipal watersheds. The remaining 113 6th-HUCs have no risk, since they do not contain any municipal watersheds. Figure IV-6 presents a map of these results.

Figure IV-6.


WP (2) Watersupply watershed
in 6th-HUC
WP-2: Watersupply watersheds in 6th HUC
none (0)
average (1-3)
most (4-6)

Special-Use Permits (SU)

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

Road systems located on National Forest System lands directly influence the management of all Special Use permits (approximately 1,400) to access, construct and maintain privately owned lands/facilities on or adjacent to the forest. Permitted uses vary from the operation of septic systems, water diversions for public water systems, natural gas pipelines, power transmission lines, hydroelectric power generation, recreation concession operations, major communication sites, wastewater treatment plants, etc.

Forest Service road systems provide direct access to 28 major communication sites on the forest to include WLOS Television, and UNCA Public Broadcasting; they serve as major microwave hubs for the telecommunication industry along with providing public service uses for the State Highway Patrol, Park Service, FBI and local law enforcement and rescue services.

Road corridors are also utilized to co-locate other linear uses such as electrical transmission, natural gas, cable television and telephone services. These utility corridors provide direct services to the public, provides connectivity between various power grids across the state and at the same time, allow for the

Concurrent with this, use of road systems that are reserved by deeds, rather than permit, should also be considered. Frequently, when the tract was acquired from a private landowner, the deed contained reservations for access, installation and maintenance of utilities, springs, mineral rights, etc. As this reservation was a condition to federal land acquisition, road systems should be managed in a way not to affect these rights.

General Public Transportation (GT)

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

No communities in Western North Carolina depend on Forest Service roads for primary access. However, several forest roads do provide a critical link for commuters between home and the workplace. Table IV-3 is a list of these roads. Still others compliment the state road system and have high traffic volumes due to the fact that they are the preferred routes (shortcuts) between state roads.

The population of the eighteen counties wholly or partially within the proclamation boundary of the Nantahala or Pisgah National Forests is listed in the 2000 census as 817,508, a 15% increase in the last 10 years. Traffic on these routes is expected to continue to climb.

TABLE IV-3. Forest System Roads Providing Critical Links to the State System

Road Name	Road Number	Length
Upper Santeetlah	81	10.6
Cold Springs	148	6.1
Catheys Creek	471	7.4
Bluff Mountain	3506	1.8
Roseboro Gragg	192	6.5
Roses Creek	210	13.4
Edgemont Pinola	464	9.0
Curtis Creek	482	7.9
Roseboro Edgemont	981	4.5
Mortimer Piedmont	982	7.5
Bullpen	1178	4.8
Evans Creek	4621	1.6
Davidson River	475	7.5
Bent Creek	479	6.1
Yellow Gap	1206	13.1
Davis Creek	420	3.9
Connelly Creek	86	3.7
Winesprings Whiteoak	711	15.1
Upper Nantahala	67	11.8
Winding Stairs	422	3.1
Rainbow Springs	437	12.4
Tuni Gap	440	5.7

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

Most private lands within the proclamation boundaries are well served by state roads or by forest service arterial and collector roads. Lower standard local roads provide access to some smaller parcels. Many of these roads are restricted for use by the private landowner and are blocked with a gate. There are other small parcels that currently have no access.

Access needs to in-holdings are addressed on an individual basis as requests are received. Forest Service policy is that access will be provided to a level that is reasonable and suitable for the uses occurring on the land. When landowners desire access, they are asked to apply for a special use or road use permit. The application is then analyzed through the NEPA process to determine possible environmental effects and the level of reasonable access required. When subdivision occurs on larger private parcels, the Forest policy is to require the landowners create an association or some type of consolidated organization to represent all of the landowner interests. This eliminates the need for the Forest to enter into road use or special use permits with each individual landowner. Responsibilities for improvements and maintenance should be determined through a commensurate share process. If access is being provided by a public road agency such as the state, then the Forest Service may not be obligated to provide any additional access over federal lands. When larger developments or subdivisions occur and in-holding traffic is expected to exceed that generated by the users of the National Forest, agency policy is to pursue turning jurisdiction of the Forest road over to another public road authority such as the state.

Many roads accessing the Forest pass through private lands before entering the Forest. Most of these have existing rights-of-way and are maintained by the Forest Service. In several cases many private home construction has accelerated to the point that homeowner traffic exceeds forest user traffic. The Forest is actively pursuing transferring the road maintenance responsibilities to the private landowners or the state. However, the state insists that the roads meet state standards before they will take them over.

Sixty roads have been identified that provide access for private lands as their primary use. Thirty-nine are open year-round, 18 are restricted with private access only, and 3 have seasonal closures. Ten of these roads are maintain by private landowners. Table IV-4 displays information concerning these roads.

TABLE IV-4.

Roads with Private Access Being the Primary Use

Number	Name	Length	District	Functional_Class	Oper_Maint_Level	Primary_Maintainer	Surface_Type	Status	Row	Estimated Traffic Volume	Road Standard
2369	BLUE BOAR	1	Cheoah	LOCAL	3	FS	AGG	RESTRICTED	N/A	VERY HIGH	OKAY
2369A	BLUE BOAR LODGE	0.7	Cheoah	LOCAL	3	FS	AGG	RESTRICTED	N/A	VERY HIGH	OKAY
2535	BROOKSHIRE	0.5	Cheoah	LOCAL	3	P	IMP	RESTRICTED	NA	LOW	OKAY
2321	CLYDE DAVIS	0.25	Cheoah	LOCAL	3	FS	IMP	SEASONAL CLOSURE	N/A	MODERATE	OKAY
385	CORNSILK	0.8	Cheoah	LOCAL	3	FS	AGG	RESTRICTED	EXISTING	MEDIUM	OKAY
2387	ELLER BRANCH	0.3	Cheoah	LOCAL	2	FS	NAT	RESTRICTED	NA	LOW	UPGRADE
2519	FARLEY CEMETERY	0.9	Cheoah	LOCAL	3	FS	AGG	RESTRICTED	EXISTING	MODERATE	OKAY
2320	FRANK ROGERS	0.5	Cheoah	LOCAL	3	FS	IMP	SEASONAL CLOSURE	N/A	MODERATE	OKAY
2608	GREEN GAP	0.2	Cheoah	LOCAL	3	FS	AGG	RESTRICTED	EXISTING	MEDIUM	OKAY
2536A	HYDE FARM	0.54	Cheoah	LOCAL	3	FS	AGG	RESTRICTED	N/A	MODERATE	OKAY
385A	LAMBERT ROAD	0.2	Cheoah	LOCAL	3	FS	AGG	RESTRICTED	NA	LOW	OKAY
2322	LEWIS	0.2	Cheoah	LOCAL	3	P	IMP	SEASONAL CLOSURE	N/A	MODERATE	OKAY
2537	LOWER STECOAH CR	0.3	Cheoah	LOCAL	3	FS	AGG	RESTRICTED	EXISTING	MODERATE	OKAY
2536D	LOWER TUSKEEGEE	0.1	Cheoah	LOCAL	4	P	AGG	OPEN	N/A	LOW	OKAY
418	SHELL STAND	1.358	Cheoah	COLLECTOR	3	FS	AGG	RESTRICTED	N/A	VERY HIGH	UPGRADE
2370	TEEOATLAH BRANCH	0.15	Cheoah	LOCAL	3	FS	AGG	RESTRICTED-LOW	NA	LOW	OKAY
438	WAUCHECHA	3.838	Cheoah	COLLECTOR	3	FS	AGG	RESTRICTED	N/A	LOW	OKAY
3549	CATALOOCHEE	1.4	French Broad	LOCAL	3	FS	AGG	OPEN	EXISTING	MODERATE	OKAY
3543	GARENFLO GAP	0.25	French Broad	LOCAL	3	FS	AGG	OPEN	N/A	MODERATE	OKAY
3520A	SANDY JOHN RIDGE	0.15	French Broad	LOCAL	3	FS	IMP	OPEN	N/A	LOW	OKAY
3564	WILKINS CREEK	0.619	French Broad	LOCAL	3	FS	AGG	OPEN	N/A	LOW	OKAY
3536	WILLARD SWANEY	0.53	French Broad	LOCAL	1	P	AGG	RESTRICTED	N/A	LOW	OKAY
58	KAWANA	4.544	Grandfather	LOCAL	3	FS	AGG	OPEN	N/A	MODERATE	UPGRADE
45	WATAUGA TURNPIKE	4.556	Grandfather	ARTERIAL	4	FS	AGG	OPEN	N/A	VERY HIGH	UPGRADE
4668	BEECH FLAT CREEK	2.4	Highlands	LOCAL	1	FS	AGG	OPEN	NEEDED	LOW	UPGRADE
4525	BUCKEYE CREEK	0.7	Highlands	LOCAL	2	FS	AGG	OPEN	EXISTING	MODERATE	OKAY
4646	CHASTINE CREEK	2	Highlands	LOCAL	2	FS	AGG	OPEN	N/A	VERY LOW	UPGRADE
329	CORBIN CREEK	0.4	Highlands	LOCAL	2	FS	IMP	RESTRICTED	N/A	VERY LOW	OKAY
4621	EVANS CREEK	1.6	Highlands	LOCAL	3	FS	AGG	OPEN	EXISTING	MODERATE	OKAY
4648	GAGE CREEK	0.4	Highlands	LOCAL	2	FS	AGG	OPEN	N/A	LOW	UPGRADE
4666A	HUNT CABIN	0.4	Highlands	LOCAL	2	FS	AGG	RESTRICTED	EXISTING	LOW	UPGRADE
4651C	INDIAN CAMP	4	Highlands	LOCAL	3	FS	AGG	OPEN	N/A	LOW	UPGRADE
4672	LAUREL FALLS	1	Highlands	LOCAL	1	FS	AGG	OPEN	N/A	MODERATE	OKAY
4610	LEDFORD BRANCH	0.8	Highlands	LOCAL	2	FS	NAT	OPEN	N/A	LOW	UPGRADE
4627	LLOYD COVE BRANCH	0.4	Highlands	LOCAL	3	P	AGG	OPEN	N/A	MODERATE	OKAY
4503A	MIDDLE CREEK FALLS	1.3	Highlands	LOCAL	2	FS	AGG	OPEN	EXISTING	LOW	OKAY
4666	PINEY MTN FLATS	1.5	Highlands	LOCAL	2	FS	IMP	OPEN	EXISTING	MODERATE	OKAY
4543	RATTLESNAKE ROAD	0.2	Highlands	LOCAL	2	FS	AGG	OPEN	EXISTING	VERY LOW	OKAY
4651A	ROCK BRANCH ROAD	1	Highlands	LOCAL	1	FS	NAT	OPEN	N/A	LOW	UPGRADE
4669	ROUGH BUTT	4	Highlands	LOCAL	2	FS	AGG	OPEN	NEEDED	LOW	OKAY
4669A	ROUGH BUTT CON.	0.4	Highlands	LOCAL	2	FS	AGG	OPEN	NEEDED	LOW	OKAY
326	WILDCAT CREEK	0.4	Highlands	LOCAL	3	FS	AGG	OPEN	EXISTING	MODERATE	OKAY
5582	IRON MTN SOUTH	0.739	Toecane	LOCAL	2	FS	AGG	OPEN	N/A	LOW	OKAY
5562	LEATHERMAN FORK	0.6	Toecane	LOCAL	2	P	NAT	OPEN	NEEDED	VERY LOW	DOWNGRADE
231	LOWER STAIRE	0.56	Toecane	LOCAL	3	FS	AGG	OPEN	N/A	MODERATE	OKAY

5554	OGLE MEADOWS	1.901	Toecane	LOCAL	3	P	AGG	OPEN	N/A	HIGH	OKAY
7290	ANDY GAP	0.25	Wayah	LOCAL	4	FS	AGG	OPEN	EXISTING	LOW	OKAY
7070	BEASLEY CREEK	0.3	Wayah	LOCAL	2	FS	AGG	OPEN	NEEDED	MODERATE	UPGRADE
7073	BIRD FALLS	0.53	Wayah	LOCAL	4	FS	AGG	OPEN	EXISTING	HIGH	OKAY
7302	BREEDLOVE	0.2	Wayah	LOCAL	2	P	AGG	OPEN	NEEDED	VERY LOW	OKAY
7072	BROWN CREEK	0.6	Wayah	LOCAL	3	FS	NAT	OPEN	EXISTING	MODERATE	OKAY
7303	CHARLEY BR	0.2	Wayah	LOCAL	2	P	AGG	OPEN	NEEDED	VERY LOW	OKAY
7071	FED COVE	0.31	Wayah	LOCAL	2	FS	AGG	OPEN	EXISTING	VERY LOW	OKAY
7270	JUNALUSKA GAP	2.5	Wayah	LOCAL	2	FS	AGG	RESTRICTED	N/A		OKAY
415	LEE CREEK	2.227	Wayah	LOCAL	3	FS	AGG	OPEN	EXISTING	HIGH	OKAY
7060	MOUSE MT	0.5	Wayah	LOCAL	2	FS	AGG	OPEN	EXISTING	VERY LOW	OKAY
7197	ONION MTN	0.5	Wayah	LOCAL	3	P	AGG	OPEN	N/A	VERY LOW	OKAY
437	RAINBOW SPRINGS	12.405	Wayah	LOCAL	4	FS	AGG	OPEN	NEEDED	VERY HIGH	UPGRADE
7279	RAY BRANCH	2	Wayah	COLLECTOR	2	FS	AGG	RESTRICTED	N/A	LOW	OKAY
7052	YOUNCE CREEK	0.31	Wayah	LOCAL	3	FS	AGG	OPEN	EXISTING	VERY LOW	OKAY

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

Numerous roads crossing the National Forest fall under the jurisdiction of agencies other than the Forest Service. When desirable, cooperative agreements should be established to share road improvement and maintenance responsibilities when all partners can benefit. The Forest Service, Federal Highway Administration and the North Carolina Department of Transportation signed a Memorandum of Understanding (MOU). This document set forth general procedures for planning, programming, environmental studies, design, construction and maintenance of designated Forest Highways. Portions of these forest highways are still under the jurisdiction of the Forest. When funding is secured and improvements are made to bring these sections to Federal Highway Administration standards, the intent is to turn them over to the state. The Forest needs to cooperate with these agencies by supporting them in their efforts to obtain funding through the Federal Lands Highway Program.

At present, there are no formal agreements between the National Forest and the North Carolina DOT to share in road operations or maintenance. These agreements identify forest system roads that would benefit from mutual cooperation for maintenance and improvements needed for public, administrative, and commercial access to the National Forest.

There are no cost-share agreements with private or public landowners on the Forest. There is a need to pursue agreements of this type. A prime example of where such an agreement should be pursued is with private landowners along PFSR 437, Rainbow Springs Road. Unfortunately the diversity of ownership and the lack of a homeowners association make negotiations difficult.

Rights of access by law, reciprocal rights, or easements are recorded in Forest files and county courthouse documents. The Forest recognizes these rights and works with the owners to preserve access while protecting the natural resources and facilities on adjacent National Forest Lands. There is also an understanding by the Forest Service that individuals or entities may have established valid rights, unknown to the Forest Service at this time, to occupy and use National Forest lands and roads.

The courts have established that such valid outstanding rights may be subject to some federal regulation. See *Sierra Club v. Hodel,* 848 F 2d. 1068 (10^{th} Circuit, 1988). This analysis recognizes that such valid outstanding rights may exist and the Forest Service will certainly honor such rights when it is subsequently determined that the specific facts surrounding any claim to such rights meet the criteria set forth in any respective statute granting such occupancy and use (see *Washington County v. The United States,* 903 F. Supp. 40 [D. Utah, 1955]).

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

In 1975, the Forest Service developed a Memorandum of Understanding with the Federal Highway Administration that required the Forest Service to apply the requirements of the national highway safety program, established by the Highway Safety Act, to all roads open to public travel. In 1982, this agreement was modified to define "open to public travel" as "those roads passable by four-wheeled standard passenger cars and open to general public use without restrictive gates, prohibitive signs…" Most roads maintained at level 3, 4, and 5 meet this definition. Design, maintenance, and traffic control on these roads emphasizes user safety and economic efficiency. The largest proportion of road maintenance and improvement funds allocated to the Forest is spent on these higher standard roads.

Safety work such as surface maintenance, roadside clearing and installation and maintenance of warning and regulatory signs are performed on an annual basis. Traffic control signing follows standards set forth in the Manual on Uniform Traffic Control Devices (MUTCD). Exceptions are permitted where state or county practices on similar public roads deviate from these guidelines.

When accidents occur on Forest roads, often the Forest Service is not immediately informed unless an employee is involved. Accidents involving only public motorists are reported to the local sheriff or state patrol, if reported at all. When the Forest does become aware of an accident, an investigation is initiated to attempt to identify the cause. If a feature of the road is found to be unsafe, addressing the condition becomes a high priority. Presently, there is no comprehensive program on the National Forest in North Carolina for identifying accident locations and for maintaining surveillance of those locations having high accident rates or losses as is required by Highway Safety Act. The Forest needs to address this area of non-compliance.

Infra Report RTEWK01L dated September 06, 2002 summarizes results of road condition surveys and reveals a backlog of $121,061 in deferred health and safety work items. The majority of these needs are on Maintenance Level 3-5 roads. Warning and regulatory signing is the largest contributor to this backlog. As funding levels permit, these signs are being installed. Sign maintenance after installation is part of the annual maintenance program of work

Many arterials and collectors do not meet standards for alignment or roadbed width. Built originally for commercial use, design considerations did not emphasize the high volumes of public recreational traffic that the roads are experiencing today. Many roads are lacking sight distance, turnouts, and adequate lane width needed for the higher volume and speed of traffic now occurring.

During watershed and project-scale analysis, Forest officials should give high priority to decommissioning those roads that pose the greatest risk to public safety. Travel management regulations are posted on the ground and described on the Forest Visitor's map. These regulations have been established by the Forest to enable safe motorized travel while protecting natural resources and minimizing conflicts between users.

Administrative Uses (AU)

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

There are three Experimental Forests on the Nantahala and Pisgah National Forests. Coweeta Hydrological Laboratory (5500 acres) is a Biosphere Ecological Reserve. Bent Creek Experimental Forest (5240 acres) is a regional center for the study of trees and other woody plants. Blue Valley Experimental Forest (1400 acres) provides a focal area for silvicultural research of eastern white pine and associated hardwoods. The experimental forests generally have good road access. Two research natural areas are designated (1460 acres); Walker Cove and Black Mountain are managed in an undisturbed state for comparison with today's forest management practices. Both are accessible by an open road.

Across the rest of the Forests, roads may be a consideration in locating inventory and monitoring sites. Sometimes it is desirable to have sites near roads and other times sites need to be located away from roads in order to escape the zone of influence associated with the road and factors such as human activity and the suite of plant species that tend to be near roads.

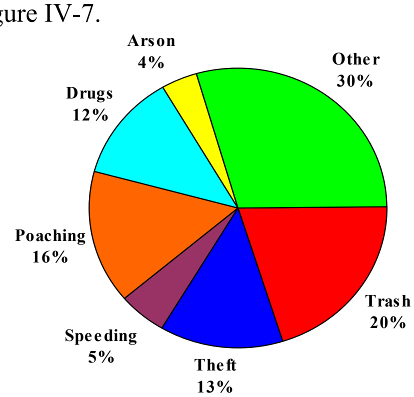
While the existing open road system appears to provide adequate access for inventory and monitoring, on some occasions researchers have had to alter inventory and monitoring plans due to poor road conditions. If a researcher finds a road impassable that should be open and drivable for passenger cars, it could delay or change the research design.

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

The level 3, 4, and 5 road system on the Pisgah and Nantahala National Forests generally provide good access for investigative and enforcement activities. These roads provide access to developed and dispersed recreation sites where many common violations occur. These roads also provide access to the many developed trailhead-parking areas for the trail system that provides backcountry access. While the road system provides access to perform investigative and enforcement activities, it also provided access for increasing public use of the National Forests. The result is the Forest is experiencing an increase of criminal activities. In FY2001, Seventy-three (73) arrests were made, 1961 citations were processed, and 225 warning notices were processed on the National Forests in North Carolina.

Road Related Law Enforcement Issues

Figure IV-7.



Road related law enforcement issues were identified on 160 roads in this analysis. See Figure IV-7.

Major complaints received from users of the National Forests in North Carolina usually concern disturbances, threats and intimidation, vandalism, vehicle break-ins, theft of forest products, illegal dumping, disposal of hazardous materials, resource damage and the growing problem of illegal drug use. These law enforcement issues are all facilitated by the existence of a good road system.

Off-road motorized travel, primarily ATV use, is the most common travel management violation, and the level 3, 4, and 5 road system provides the access for these vehicles. The demand for ATV opportunities on the Forest is increasing. People driving around gates on closed roads are another travel management violation. This is frequently done to access hunting or fishing spots. Theft of forest products is also usually directly related to the open road system. These violations mostly involve thefts of firewood, planted saplings, and Christmas trees.

There are increasing incidences of minors in possession of alcohol and illegal drugs on the Forest. Much of this activity is in the form of evening partying. These gatherings often result in other resource and property vandalism. While the road system on the Forest facilitates illegal activities, there are no known direct road-related causes of significant illegal activities.

Protection (PT)

PT (1), PT (2), & PT (3): How does the road system affect fuels management? How does the road system affect the capacity of the Forest Service and cooperators to suppress wildfires? How does the road system affect risk to firefighters and to public safety?

Fuels Management consists of actively mitigating potential fire behavior by manipulating the fuels amount and arrangement in a given area. Timber sales, bug killed areas and storm damage are a few of the reasons that the fuels may accumulate to a level that would sustain increased fire behavior. This in turn increases the danger to the public as well as those tasked with fire suppression. Eliminating the natural occurrence of fire effects through sustained fire suppression also greatly effects the fuels environment. The value of a road from a fuels management perspective is due to whether or not the road is necessary for fuels treatments through prescribed fire or other means. It may be needed for access and/or it may be useful as a fuel break or barrier, effectively stopping the potential spread of a fire by decreasing fuel continuity.

Roads can be either an asset or liability for fire suppression. The safety of human life is the most basic concern. Roads may serve as a significant firebreak in areas requiring a permanent fuel break such as between forested areas and residential areas. The road many provide usable access to an otherwise inaccessible area. The degree to which a road allows for more safe and/or efficient fire suppression efforts depends on factors such as strategic location, navigability of the terrain, having vistas of the surrounding environment and roads designed and maintained to carry the type of traffic common to fire suppression. Road segments interspersed with private land ownership are more difficult to manage for quality and accessibility yet may provide the only egress for the private landowners if fire occurs. The negative aspects of a road for suppression are associated with providing an apparent tool for ingress and egress, which upon further inspection may effectively draw a crew into an area having many of the risk factors of entrapment. Negative aspects of a road may include:

- The roadbed is not maintained to support larger, heavier equipment.
- The road dead-ends with limited or no options to turn equipment around.
- Limited sight distance.
- Switchbacks are sharp, steep or routinely rutted/rained out.
- The roadbed follows along or crosses into the bottom of a drainage.
- The road ownership patterns make it hard to predict obstacles or hazards.

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

This was not identified as an issue on the Forests. Airborne dust is a component of particulate matter that is monitored by the North Carolina Department and Natural Resources and others at four locations near the Forests. Particulates 10 microns or smaller in size (PM_{10}) are of concern because they can adversely impact people's health, reduce the visibility of the mountains, and reduce how far and clearly a person can see when driving along a roadway. Overall, the PM_{10} values recorded near the Forests are below levels of concern for human health (150 ug/m^3) and roadway visibility impairment.

Recreation: Unroaded Areas (UR), Road-related Recreation (RR)

[Corresponds to UR (1) and RR (1)]: What are the supply and demand relationships for non-motorized and/or motorized recreation opportunities?

Supply and demand for recreation opportunities are estimated during the forest planning process. The Nantahala-Pisgah Forest Plan allocates management areas across the Forests that provide direction for forest management including roads and recreation opportunities. Each management area specified the types of recreation opportunities to be provided, and these correspond to a Recreation Opportunity Spectrum (ROS) class. The current allocation of management areas translates to the approximate acreage by ROS class listed in Table IV-5 below. This can be considered the current supply of recreation opportunities (see Appendix D for additional detail on ROS/Management Area Direction).

Table IV-5. Current Supply of Recreation Opportunities

ROS Class	Road Management Emphasis	Amount
Rural (R)	Motorized access to highly developed areas	2000 Acres
Roaded Natural 1 (RN1)	Travel corridors and areas with motorized recreation emphasized	119,700 Acres
Roaded Natural 2 (RN2)	Some motorized access but non-motorized opportunities emphasized	665,000 Acres
Semi-Primitive Non-Motorized (SPNM)	No motorized access	148,300 Acres
Wilderness (W/P*)	No motorized access	66,500 Acres

* Wildernesses are managed to provide as primitive a setting as possible.

When the Forest Plan was developed, ROS classes were assigned using demand projections for recreation opportunities current at the time. More recent trends and projections indicate increasing participation by the public in non-motorized and motorized recreation as well as a growing population in the region and near the Forests (Southern Appalachian Assessment, 1996). At peak periods use reaches capacity at some places on the Forest but opportunities could be enhanced in other areas to disperse some of this use. Existing roads are generally adequate to provide access to a wide variety of motorized and non-motorized opportunities. Off-highway vehicle (OHV) opportunities exist at several places on the Forest but are limited by topography and other constraints. In the long-term, demand will begin to exceed the realistic supply of both non-motorized and motorized recreation opportunities at more locations on the Forest.

UR (2) and RR (2): Is developing new roads into non-motorized areas, decommissioning of existing roads, or changing the maintenance of existing roads causing substantial changes in the quantity, quality, or type of non-motorized and motorized recreation opportunities?

Since NP LRMP Amendment 5 in 1994 there has been very little road construction activity and road reconstruction is trending downward. No roads were constructed in areas presently managed as SPNM. Thirty-three miles of road were decommissioned between 1999 and 2001.

Decommissioned roads generally have low use or significant impairment to use. Overall, no substantial change in available recreation opportunities has occurred forest-wide. This question may be appropriate to address at the project level, when a road project would affect recreation opportunities.

Approximately 807 miles of Forest Service roads are open for public use most of the year. Ultimately, most forest recreation depends on the access provided by roads. However, the present level of road access as a whole is adequate to disperse recreation use across the Forests. There are site-specific needs for road improvements or relocations in some places and there are roads that have a low priority for use by recreation visitors. The priority of specific open roads and how they fit with ROS and management area allocations is addressed as part of this analysis.

Sixty-two (62) OHV trail miles are available on Nantahala National Forest and 33.5 on Pisgah National Forest. OHV trail mileage is inadequate to meet long-range demand but there are many constraints on providing a significant increase in mileage. Other providers, public and private, would need to help in meeting the demand for more OHV trail mileage.

How do user-created routes affect the management of the road system?

User-created OHV routes are a problem in some areas of the Forest. Some of this use follows old roadbeds while other routes are pioneered by users and attract additional illegal use. Patterns of illegal use are difficult to change once started and adequate law enforcement personnel are not available to control the problem. These illegal routes essentially have the same negative environmental effects as poorly managed roads and are drains on Forest financial resources.

Illegal motorized use and user-created routes will be addressed in more detail watershed or project level analysis.

UR (3) and 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 non-motorized and motorized recreation opportunities?

Noise was not identified as an issue for the Forest-scale RAP, and no public comments mentioned noise as a problem associated with the open roads.

Noise from road construction and maintenance may be intense but are short-term, whereas traffic noise from most Forest Service roads is less intense, but may be an every-day occurrence. Noise issues are generally associated with higher traffic volume roads, whereas traffic volumes of Forest Service roads are generally low relative to state roads or federal highways, However, road noise close to sensitive areas may affect the recreation experience and preclude areas from providing the feelings of solitude and remoteness so important to some Forest visitors. Few roads have been built or reconstructed in areas that emphasize non-motorized opportunities in the last decade. The proximity of existing roads to sensitive areas and remote areas is a factor being considered in the overall value/risk rating assigned to individual open roads as a part of this analysis.

UR (4) and RR (4): Who participates in non-motorized recreation and motorized recreation in the areas affected by constructing, maintaining, and decommissioning roads?

Obviously some roads are more important to the public than others. Some roads have traditional uses such as access to places to gather forest products, a route to a favorite recreation site or trailhead, or simply as a travelway to view forest and mountain scenery. Recreation visitors are multi-dimensional in their interests, but sociologists and other researchers have attempted to group them into some general areas of interest. Usually as people age they prefer more conveniences and easier access. Disabled visitors have specific needs for access. Remoteness and adventure are important to many users.

These various preferences were considered in the allocation of management areas and ROS classes in the Forest Plan. Providing road management consistent with the emphasis of each management area is a major consideration—road decommissioning or closure may be appropriate for open roads in management areas that emphasize non-motorized recreation.

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

The social and recreational value of each road was evaluated. Those open roads that were thought to have stronger attachments for social or recreational value were rated as having a higher priority in those categories.

Through the public participation process, members of the public identified specific feelings they have about Forest Service roads in general and specific terms. In general, the public expressed positive feelings toward the settings provided by the relative primitive, unpaved system of roads that traverse the Forests. Strongly expressed was the idea that these roads not be widened or paved, so the current ambiance remain essentially as it is, without the increased traffic and vehicle speeds that might accompany such road improvements. Over time, more and more public roads outside the National Forest boundaries are widened and paved, so the opportunities for similar driving experiences decrease with each passing year.

Similarly, the nature of the recreation opportunities accessed by Forest Service roads is seldom duplicated on private lands. With a few exceptions such as commercial sites Chimney Rock Park and Grandfather Mountain, the public has little access to private forestland. Other public agencies also provide some similar recreation opportunities, such as hiking, at sites such as Great Smoky Mountains National Park, Dupont State Forest, Gorges and Mt. Mitchell State Parks.

How does the road system affect Visual Quality? How is developing new roads, decommissioning of existing roads, or changing the maintenance of existing roads into unroaded/non-motorized areas affecting Visual Quality?

Visual Quality Objectives (VQO's) are set during the forest planning process. Two major visual factors regarding roads are (1) the view of roads as a long-term modification of the landscape and (2) recreation visitors' views from roads. Roads introduce an obviously human modification into a natural-appearing landscape. There are ways to lessen the visual effect of road construction and maintenance such as careful alignment and minimum clearing and grading. Also, careful vegetation management, proper drainage, and road surface maintenance can enhance views from and along a road.

Relatively few NFS roads have been built on the Forests in the last decade and few are anticipated for the near future. However some road improvements may occur that will alter the landscape. Also, state and federal highways at times need relocation or extensive new construction. Several state highway projects are now in progress. Extensive efforts are being made to lessen the visual impacts of these new routes. These state or federal road projects are addressed through the NEPA process to ensure that Forest Plan standards are met.

Passive-Use Value (PV)

PV (1), PV (2), PV (3), PV (4): 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? Do areas planned for road building, closure, or decommissioning, have unique cultural, traditional, symbolic, sacred, spiritual, or religious significance? What, if any, groups of people (ethnic groups, subcultures, and so on) hold cultural, symbolic, spiritual, sacred, traditional, or religious values for areas planned for road entry or road closure? Will building, closing, or decommissioning roads substantially affect passive use value?

People do not have to be active users of the Forest Service road system in order to hold values regarding access to Forest Service lands, or to benefit from the existence (or nonexistence) of the road system. These "passive-use values" are values or benefits people receive from the existence of a specific place, condition, or thing--independent of any expectation of themselves participating in active use of it. For example, some people believe that forest roads should be kept at a minimum because of the negative ecological impacts that are sometimes associated with roads (i.e. habitat fragmentation, water quality concerns). Others believe it is important to maintain large tracts of unroaded land in order to protect wilderness values, and leave a legacy of undeveloped land for future generations to experience. Alternatively, some people who do not use the Forest Service road system believe it is important to maintain or expand that system in order to promote values such as resource extraction opportunities, fire protection, and tourism.

The Cherokee Indians have abundant ties to the N/P forests. Many Traditional Cultural Properties are known to exist, and are valued by tribal members whether or not they personally use the site. The affected tribes are the Eastern Band of Cherokee, Cherokee Nation, and United Keetowah Band of Cherokee.

Passive-use value was not identified as an issue for the Forest-scale RAP, since no decisions pertaining to road construction or closing are made in this process. Passive-use may be identified as an issue at the project-scale.

Social Issues (SI)

[The following questions were reworded from the social questions on the national list to be more specific to the Nantahala-Pisgah National Forests. Since only existing open roads are being addressed in detail in this analysis, some questions can only be answered in detail at the watershed- or project-scale.]

Who are the direct users of the road system and of the surrounding areas?
What activities are they directly participating in on the forest? Where are these activities taking place on forest?

Access involves a person (who) making a decision to travel to a place or on a route (where), using one or more modes of transportation (how) at a certain time (when) for a specific reason (why), to participate in an activity (what). Specific uses of each open road and the general origin of users was used in assigning social values to roads.

Many different people use the Forest Service road system, including residents of surrounding communities, visitors and tourists to national forests and grasslands, and groups of people (ethnic groups, subcultures, etc.) who may hold cultural, spiritual, sacred, traditional, or religious values associated with national forest system lands.

Ensuring users are identified and considered will assist in developing an inclusive RAP process. Some activities can take place throughout the forest; many types of management areas or recreation opportunity (ROS) settings provide opportunities for driving for pleasure, hunting, fishing, wildlife viewing, or nature study. Other activities require more specific settings or infrastructure such as developed camping, rock climbing, hiking, Wilderness hiking, or boating. The more limited or rare an opportunity the more likely users will be interested in protecting their access to area.

Why do people value their specific access to national forests and what opportunities does access provide?

This analysis highlights values of access associated with specific users on open roads.
People who return each year to the same dispersed camping area for a family reunion value their access to the forest for family connectedness, but at the same time, they may also value the limited road system because they enjoy their hiking access into the adjacent backcountry or Wilderness.

These are the types of values people hold toward their access, and often are the basis for conflicts when management changes current opportunities or new/different user groups begin using the same area. Thus these values are important to understand when considering travel management.

What are the broader social and economic benefits and costs of the current forest road system and its management?

Many communities and individuals have social and economic dependencies on forest roads and the resources provided by access to them. Changes to a road system or in road management may affect (positively or negatively) local commuting patterns, lifestyles, forest resource-related businesses, the collection of special forest products; school bus routes; firefighting access needs in the wildland-urban interface; and access to municipal water supplies, power lines, and other local infrastructure.

The benefits provided to communities around national forests extend beyond those who directly access or use forest resources. For example, people owning or working in businesses in 'gateway' communities often benefit from tourism associated with people visiting their national forest. Local businesses also benefit through resource activities including timber harvest, road development and maintenance, water projects, and other special uses in terms of potential economic activity.

Communities may benefit with infrastructure development that enhances their local quality of life, but at the same time, may negatively impact surrounding resources other people value for their quality of life. These externalities may include impact to resources such as soil, water, habitat, visual quality or damage to values people hold to an area such as an unroaded character, limited accessibility, or solitude.

Others from ethic groups, subcultures, tribes, national interest groups, as well as local residents of the area can hold cultural, spiritual, sacred, traditional, symbolic, or religious values associated with access to specific places, opportunities or resources on the national forest.

How does the road system and road management contribute to or affect people's sense of place?

"Sense of place" describes the character of a physical location and the meaning, value, and feelings that people attach to it because of their experiences there. It integrates interpretations of a geographic place, including the biophysical setting, psychological influences (memory, choice, perception, imagination, emotion), and social and cultural influences. Changes in road management can affect access to these special places, or change their biophysical setting, affecting what people value or desire about an area, and their sense of place.

People's sense of place is directly tied to the characteristics of an area, including the area within a road corridor, that invoke a special feeling or attachment to the area.
Factors may include the area's vegetation, fish and wildlife resources, amount of sunlight available, views, solitude, opportunities that make it a destination, and the overall familiarity to an individual or group.

Roads often facilitate a person's enjoyment of the area by providing for driving comfort, the amount and type of use, and any number of aesthetic attributes visible alongside the road. Sometimes the road itself is the place a person enjoys. People have local name for specific roads, they enjoy driving specific routes, and consider such driving activity a part of their connection with an area. These attributes are directly related to road management. Any changes in this management will likely change people's sense of place and impact current uses.

Some places are significant enough to individuals, groups, or communities that if the opportunity to use a specific site is lost, the continuation of those activities no longer takes place – there is no substitute site for the activity because the site itself is the reason people participate. The presence or absence of substitute sites, and the potential displacement of people from their 'chosen' site should be considered.

What are the current conflicts between users, uses, and values (if any) associated with the road system and road management? Are these conflicts likely to change in the future with changes in local population, community growth, recreational use, resource developments, etc?

Conflicts often occur between different types of users--motorized vs. non-motorized, hunting/fishing vs. non-consumptive users, recreational users vs. tourism, and resource preservation vs. resource extraction. Understanding these conflicts provides needed context for road management, enabling decision-makers to predict the social effects of their decisions with regard to existing conflicts. It will also help decision-makers to formulate road management decisions that may help resolve or mitigate these conflicts.

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

The road system is the access to many of these sites. Sites are susceptible to looting and vandalism. Traditional Cultural Property's use can be interrupted by open-road use. Some access is needed for use of certain areas. Analyze at project level, monitor through Forest plan monitoring.

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?

See SI (1). Analyze at watershed and project levels. Consult with American Indians.

SI (5): How does road management affect roads that are historic sites?

Many roads are historic routes and / or follow portions of historic routes. Perry Gap Road, Hard Times Road and Highway 64 are examples of historic CCC roads. Many portions of roads follow Trail of Tears, Unicoi Turnpike, Rutherford's Expedition Route and other historic routes. Conduct Forest Plan, watershed and project level analyses.

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)? Is the road system used or valued differently by minority, low-income, or disabled populations than by the general population? Would potential changes to the road system or its management have disproportionate negative impacts on minority, low-income, or disabled populations?

The road system provides access to the Forests equally to all groups of people for a wide variety of activities. Certain activities, such as sightseeing, are popular with all groups; other activities are traditionally more popular with certain cultural and ethnic groups. Certain cultures and income groups are more likely to participate in gathering forest products such as medicinal plants and firewood, either for personal use or to supplement household income. American Indians use the road system to access traditional sacred sites, cemeteries, and sites for collecting traditional resources such as river cane. Of direct impact to these traditional user groups is the amount of roads that are open. Two changes in road management that could negatively impact these certain groups is closing certain roads, and upgrading of roads in some areas (such as through paving) that might increase traffic. For example, the Eastern Band of Cherokee prefer open roads be maintained as current levels (not "improved) and that some closed roads be opened for older and disabled traditional users.

Each open road is being evaluated for its social value to diverse populations—any specific civil right concerns were considered in assigning social values to roads. More specific concerns should be addressed at the watershed or project scale analysis.

Environmental Justice (CR)

Executive Order 12898, signed on February 11, 1994, calls for federal agencies to identify and address, " disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations. The environmental justice strategy shall list programs, policies, planning and public participation processes, enforcement, and/or rulemakings related to human health or the environment that should be revised to, at a minimum: (1) promote enforcement of all health and environmental statutes in areas with minority populations and low-income populations; (2) ensure greater public participation; (3) improve research and data collection relating to the health of and environment of minority populations and low-income populations; and (4) identify differential patterns of consumption of natural resources among minority populations and low-income populations."

Thus, environmental justice may be defined as "fair treatment for people of all races, cultures, and incomes, regarding the development of environmental laws, regulations, and policies" (EPA Environmental Justice homepage, June 1, 2002).

In the arena of roads management on the Forests, consideration should be given to how a road affects low-income and minority populations. For instance, if the road is used by low-income populations for access to collect forest products, or by a minority population to access a traditional gathering site, this should be given weight if changes in access are being considered.

The known significance of a road for low-income or minority populations was considered in assigning social values to roads. Further consideration of this question may occur if it is identified as an issue for a project-scale RAP.

Describing Opportunities and Setting Priorities

V.1 Introduction

In order to focus more clearly on where opportunities exist to improve the transportation system, roads in this analysis were categorized based on the key values and identified risks associated with each road. Each open Forest Service road on the Forests was evaluated for its value in providing recreation opportunities, social amenities, fire management and timber management opportunities in the context of the overall traffic volume. Likewise, each road was evaluated for the degree of risk it posed to aquatic resources, wildlife, rare species and habitats, public safety, fire suppression safety, and cultural resources. The protocols utilized to assign values and risks are described below. The complete road-by-road rating is in Appendix A. This process placed each road into one of four categories based on similar ratings: high value-high risk, high value-low risk, low value-high risk, and low value-low risk. This was done as a way to prioritize road management options, and was not intended to capture the absolute value or risk of a road.

Information was also collected to evaluate 6th level hydrologic units (HUCS), commonly referred to as “watersheds.” Each watershed is assigned to a condition class and a vulnerability class based on a number of factors, following a standardized protocol for the Southeastern United States. In addition, each 6th level HUC was assigned a rating for “aquatic biota vulnerability.” This information is a relative ranking of those watersheds containing National Forest System lands, which overall are usually in better condition that other watersheds. So, a watershed that rates “poor” relative to other watersheds in the Forests, may still have very high water quality and low sedimentation when compared to watersheds across all ownerships. This watershed-based information is important in transportation planning, as road management activities need to consider the current condition and potential vulnerabilities of the watershed(s) where the activity will take place. For example, it is highly desirable to maintain “the best of the best” as far as current watershed conditions, but those same “good condition” watersheds may be associated with high vulnerability to change. Great care is advisable with any activity in a good condition but highly vulnerable watershed, and some activities may be more appropriate in watersheds with less potential for degradation. Watershed condition and vulnerability ratings are summarized in section V.5, and listed in detail in Appendix C.

In this chapter as throughout this document, numbers and mileages are approximate.

V.2 Criteria for Assigning Values to Open Roads

V.2.1 RECREATION

Information on the amount and types of recreation uses was developed at meetings with district personnel, other public agency representatives, members of the public, and from LRMP management area designation.

High Value (2)

Road accesses major developed recreation complex and/or a wide variety of high use dispersed recreation opportunities.

Moderate Value (1)

Road accesses minor developed recreation area(s) and/or a variety of moderately used dispersed recreation opportunities.

Low Value (0)

Road accesses only minor dispersed recreation opportunities and/or non-motorized use is emphasized (MA 3, MA 4, or other special area MA), or the road's close proximity to Wilderness or other area with special characteristics is producing negative impacts.

Table V-1 displays overall rating results.   Road-by-road ratings are in Appendix A.

Table V-1. Summary of the Recreation Value of Roads

Recreation Value	# Roads	Total Road Miles
High	198	437
Medium	127	291
Low	99	79

V.2.2 SOCIAL

Information on the amount and types of social uses was developed at meetings with district personnel, members of the public, and Eastern Band of Cherokee.

High Value (2)

There are long-standing traditional uses accessed by the road and/or the road is an important through road for local users.

Moderate Value (1)

There may be some traditional uses accessed by the road or the road offers some convenience to local travelers.

Low Value (0)

There are few if any traditional uses accessed by the road and/or non-motorized use is emphasized (MA3, MA4, or other special area MA).

Table V-2 displays overall rating results. Road-by-road ratings are in Appendix A.

Table V-2. Summary of the Social Value of Roads

Social Value	# Roads	Total Road Miles
High	225	484
Medium	143	273
Low	56	50

V.2.3. TIMBER MANAGEMENT

To assign a value for timber management, an analysis was performed to establish how much access a road provides to timber production management areas. The amount of access is not only that directly provided by the open road in question, but also from closed system roads that adjoin the open road in question. Roads were rated accordingly:

High (2) = more than 2.0 miles of road accesses suitable timberland

Medium (1) = more than 0.5 mile and less than 2.0 miles of road accesses suitable timberland

Low (0) = less than 0.5 mile of road is accesses suitable timberland

Table V-3 displays overall rating results. Road-by-road ratings are in Appendix A.

Table V-3. Summary of the Timber Management Value of Roads

Timber Mgt. Value	# Roads	Total Road Miles
High	137	593
Medium	108	125
Low	179	88

V.2.4. FIRE MANAGEMENT

The two primary functions affected within Fire Management are Fuels Management and Fire Suppression. Values are assigned based on the topography, fire history and the relationship of that particular road or area to the area as a whole.

Fuels Management consists of actively mitigating potential fire behavior by manipulating the fuels amount and arrangement in a given area.

Low (0) Road is not deemed necessary for the current fuels treatments planned or being considered. Fuel arrangement and/or availability are mitigated through other permanent human-caused or natural fuel breaks or barriers.

Moderate (1) Roadbed is necessary to provide cost effective access for fuels treatment projects, or provides a necessary addition to otherwise occurring human-caused or naturally occurring fuel breaks or barriers in decreasing fuel continuity.

High (2) Due to other constraints the roadbed is the only access to areas planned for future treatment, or for accomplishment of treatments currently ongoing in the area.

Positive need for a road is established by the degree to which the road may allow for more safe and/or efficient fire suppression efforts within the area. Factors to consider include strategic location, navigable terrain, and having vistas of the surrounding environment.

Low (0) Fire suppression activities are not directed or affected by the presence of the road. Equally the roads may or may not be used for suppression forces or tactics.

Moderate (1) The road, in conjunction with time-of-need improvements or other local topographical features provides for a useable fire line or fire break, or provides some degree of usable access to otherwise inaccessible areas.

High (2) The road provides for a significant firebreak in areas requiring a permanent fuel break such as between forested areas and residential areas, or the road lessens the risk for firefighters and the public by providing necessary access and/or egress to areas having a high fire occurrence risk.

Values for fuels management and fire suppression were combined to give a total fire management value. Overall results are displayed in Table V-4. Road-by-road ratings are in Appendix A.

Table V-4. Overall Fire Management Value

Fire Management Value	# Roads	Total Road Miles
Very High	13	65
High	135	465
Medium	195	245
Low	81	31

V.2.5. TRAFFIC VOLUME

Traffic volume brings both value and risk to a road. On the risk side, high traffic volumes are associated with more risk to public safety and wildlife. On the value side, traffic volume is considered as a surrogate for need. A road with high traffic volume is a road that serves some purpose in the lives of many people. However, even a low volume road may provide a critical need for certain individuals. Overall results are displayed in Table V-5. Road-by-road ratings are included in Appendix A, The Road Matrix.

Table V-5. Summary of Traffic Volumes

Traffic Volume	# Roads	Total Road Miles
High	99	142
Medium	206	413
Low	119	251

V.3 Criteria for Assigning Risks to Open Roads

V.3.1 AQUATIC BIOTA VULNERABILITY

Aquatic biota vulnerability is a indicator that factors are associated with this road that mandate extra care be used when considering road-related actions such as maintenance, reconstruction, or changing the level or type of use. In determining the vulnerability rating, the following factors were used: percent of road paralleling stream; number of stream crossings; presence of trout (management indicator species); presence of brook trout. A summary of the results is in Table V-6. Road-by-road ratings are in Appendix A.

Table V-6. Summary of Aquatic Biota Vulnerability

Aquatic Biota Vulnerability	# Roads	Total Road Miles
High	68	74
Medium	250	434
Low	106	299

V.3.2 RISK TO RARE SPECIES AND HABITATS

A GIS analysis was performed to determine roads within 200 feet of any element occurrence of a threatened, endangered, or sensitive species; within 200 feet of a special habitat such as bogs and rock outcrops; or within 200 feet of designated old growth.

Low Risk (0)

None of the above factors occurs within 200 feet of the road

Medium Risk (1)

One element occurrence of a threatened or endangered (T&E) species, or one or more other factors are present.

High Risk (2)

More than one element occurrence of a T&E species, or one T&E element occurrence and at least one other factor. Table V-7 displays the overall results. Road-by-road ratings are in Appendix A.

Table V-7. Summary of Risk to Rare Species and Habitats

Rare Species/Habitat Risk	# Roads	Total Road Miles
High	10	51
Medium	124	383
Low	290	372

V.3.3 RISK TO WILDLIFE

The factors used to assign wildlife-associated risks to roads included: extremely excessive open road density in a management area “4;” poaching is known to have occurred; proximity to bear sanctuary; and high traffic volume.

Low Risk (0)
None of the above risk factors is present.

Medium Risk (1)
One or two of the above risk factors is present.

High Risk (2)
More than two of the above risk factors are present.

Table V-8 displays overall results. Road-by-road ratings are included in Appendix A, The Road Matrix.

Table V-8. Summary of Risk to Wildlife

Wildlife Risk	# Road Segments	Total Road Miles
High	19	94
Medium	130	297
Low	275	425

V.3.4 RISK FOR WILDFIRE SUPPRESSION

The risks are associated with providing a road that is an apparent tool, which upon further inspection increases the overall hazards of the suppression efforts. A road would be valued negatively overall if it seemingly provides access only to effectively draw a crew into an entrapment situation. The current use of crews from out of the local area and the availability of aircraft for both reconnaissance and suppression were factors in determining the risk rating of some of the roads.

Low (0) — The road and turnouts are adequate for controlled moderate to heavy traffic and the roadbed including switchbacks are maintained to provide safe passage of larger or heavier fire suppression equipment. Sight distances are adequate. The road has multiple access points.

Moderate (1) — The road doesn't enhance the safety of firefighters or the public. The roadbed and or the surrounding fuels are not situated or maintained to provide a safety zone more effectively than naturally occurring openings in the area. The road has limited access/egress opportunities.

High (2) — The roadbed is not maintained to support larger, heavier equipment. The road dead-ends with limited or no options to turn equipment around. Limited sight distance. Switchbacks are sharp, steep or routinely rutted/rained out. The roadbed follows along or crosses into the bottom of a drainage. The road ownership patterns make it hard to predict obstacles or hazards

Table V-9 displays overall results. Road-by-road ratings are in Appendix A.

Table V-9. Summary of Risk for Wildfire Suppression

Suppression Risk	# Roads	Total Road Miles
High	53	183
Medium	184	287
Low	187	337

V.3.5 SENSITIVITY FOR HERITAGE RESOURCES

A GIS analysis was performed to determine roads within 200 feet of any known archeological sites or areas. In addition, the Forest archeologist and Eastern Band of Cherokee Indians provided additional information.

Low Sensitivity (0)
Less that two known sites per mile of road

Medium Risk (1)
Two or three sites per mile of road

High Risk (2)
Four or more sites per mile of road

Table V-10 displays the overall results. Road-by-road ratings are in Appendix A.

Table V-10. Summary of Sensitivity for Heritage Resources

Heritage Resource Sensitivity	# Roads	Total Road Miles
High	82	235
Medium	108	220
Low	234	351

V.3.6 RISK TO PUBLIC SAFETY

Public safety is a critical factor in managing the transportation system. The following factors were considered in assigning a public safety risk to each road: presence of pedestrian traffic; amount of vehicular traffic; amount of year road is open; condition of road; excessive speed identified as issue; other identified law enforcement issue; other identified safety issue. Table V-11 displays the overall results. Road-by-road ratings are in Appendix A.

Table V-11. Summary of Risk to Public Safety

Public Safety Risk	# Roads	Total Road Miles
Very High	32	112
High	141	314
Medium	189	310
Low	62	70

V.3.7 MAINTENANCE COSTS

The shortfall in maintenance dollars is one reason the Roads Analysis Process regulations were passed. Because funding is not adequate for identified needs, those roads with higher total road maintenance needs, including annual and deferred, are a higher risk for health and safety and resource damage. A risk factor is assigned to each road based on the total cost of maintenance per mile. Table V-12 displays a summary of the results. Road-by-road ratings are included in Appendix A, The Road Matrix.

Table V-12. Risk Associated with Deferred Maintenance Cost

Rating	Per Mile Cost	# Road	Total Road Miles
3-Very High	> $50,000	51	97
2-High	$25,000 - $49,999	152	373
1-Medium	$7,500 - $24,999	130	207
0-Low	<$7,500	91	129

V.4 Setting Priorities

The value factors and risk factors discussed above were summed, respectively, to determine "Total Value" and "Total Risk" numbers for each road. This produced groups of roads that were assigned to one of four value/risk categories: "High Value/High Risk," "High Value/Low Risk," "Low Value/High Risk," and "Low Value/ Low Risk." Values ranged from "0" to "11" and risks ranged from "1" to "14." **The highest priority roads within each category are those at the more extreme ends of the value/risk range.** For example, a road with a value of "10" and a risk of "14" would usually be a higher priority for investment than a road with a value of "6" and a risk of "7." Appendix A – The Road Matrix displays "Total Value" and "Total Risk" numbers as well as the category assignment. All these categories are part of the potential minimum road system on the Forests. Figure V-1 displays the total number of roads and road miles in each of the four categories. Figure V-2 displays the number of roads at each value/risk point within the 4 categories. This figure demonstrates that many roads rank toward the center of the distribution.

Figure V-1. Number of Roads and Miles in Each Value/Risk Category

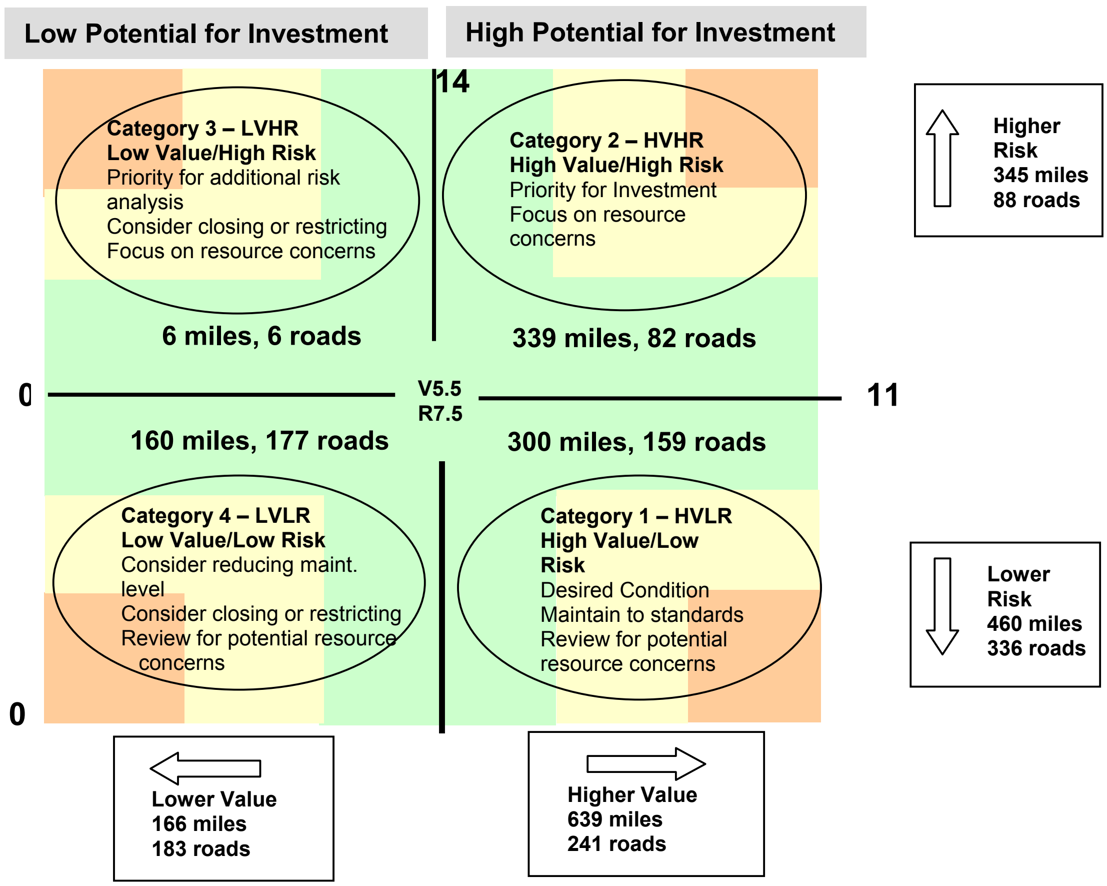


Figure V-2. Number of Roads at Each Value/Risk Point

RISK \ VALUE	0	1	2	3	4	5	6	7	8	9	10	11
14								1			4	
13												
12									2		2	
11								2		2		1
10							1	4	4		4	1
9				2			2	7	5	4	4	1
8				2	1	1	6	10	5	5	3	
7	1	1	2	2	2	8	13	6	7	1	5	
6			3	5	3	8	20	10	6	5	5	
5	1	5	4	5	7	17	20	20	2	4	4	
4		4	5	6	13	16	6	9	3	1		
3	1		8	11	6	3	4	2		1		
2	2	6	3	3	6	1	7					
1	2	2	3	1		1						
0												

Category 1: High Value and Low Risk – Ideal Situation
159 Roads – 300 Road Miles

Options:

- Focus road maintenance funds on these roads to keep them in this category.
- Potential for lessening impacts elsewhere if uses are redirected to low risk roads.

Category 2 – High Value and High Risk – Priorities for Capital Improvements
82 Roads – 339 Road Miles

Options:

- High priority for sub-forest scale roads analysis to identify high-risk reduction needs.
- High priority for capital improvement funding, such as: road improvement, road relocation, funding, capital improvement program, etc.
- Shift road maintenance funds to these roads to keep their resource risks from increasing.

Category 3 – Low Value and High Risk – Priorities for Risk Analysis
6 Roads – 6 Road Miles

Options:

- Moderate priority for sub-forest scale roads analysis to identify high-risk reduction needs and confirm use value.
- Potential for reducing maintenance level.
- Potential for closure if not needed for private access.

Category 4 – Low Value and Low Risk – Priorities for reducing Maintenance Level
177 Roads – 160 Road Miles

Options:

- Lowest priority for expending annual road maintenance funding.
- Potential for lessening impacts elsewhere if uses are redirected to low risk roads.
- Potential for reducing maintenance level.
- Potential for closure if not needed for private access.
- Consider for conversion to trail or linear wildlife opening depending on need.

V.5 Evaluating Watershed Condition and Vulnerability

The information presented here will be used during roads analysis at the watershed and project scales as well as during the LRMP revision process.

In addition to individual road ratings, 6th level hydrologic units (watersheds) were evaluated for their current condition, vulnerability to change, and vulnerability of the aquatic biota. This evaluation is useful in managing the transportation system since it may indicate which

watersheds have a high priority for maintenance or restoration activities. It also serves as an indicator of sensitivity that should be considered when projects are proposed.
This is a relative evaluation, comparing among watersheds with National Forest System lands. It is commonly recognized that watersheds with a high percentage of national forest system land generally have better water quality and less erosion/sedimentation issues than many other watersheds. Therefore, a watershed that ranks poorly using this scale may still have outstanding water quality, it may just have more of the impacting factors present than other watersheds with Forest land.

V.5.1 WATERSHED CONDITION

Watershed condition was evaluated using procedures set forth in the East-wide Watershed Assessment Protocol adopted by USDA Forest Service Regions 8 and 9 for LRMP revisions.

The following parameters were evaluated in combination to assign a condition of Good, Moderate, or Poor condition to each 6th level hydrologic unit (HUCS) in western North Carolina within the Forests' administrative boundary:

Percent national forest ownership in watershed
Number of dams/diversions in watershed
Number of landfills in watershed
Number of industrial discharges in watershed
Number of gravel pits, mines in watershed
Percent of watershed occupied by mines in watershed
Number of point sources in watershed
Percent of watershed occupied by forest
Percent of watershed occupied by urban, commercial, industrial, or agricultural use
Road density in watershed
Population density in watershed
Percent change in population density in watershed

For the 143 6th level HUCS considered, 37 were rated as good condition, 71 rated moderate condition, and 35 rated poor condition. Figures V-2 and V-3 at the end of this chapter display the HUCS and their respective condition ratings. Each road was assigned a value according to the condition of the HUC where it is located. If a road traversed more than one HUC, it was assigned the condition of the HUC that contained the greatest length of road.

V.5.2 WATERSHED VULNERABILITY

Watershed vulnerability was evaluated using procedures set forth in the East-wide Watershed Assessment Protocol adopted by USDA Forest Service Regions 8 and 9 for LRMP revisions. The following parameters were evaluated in combination to assign a vulnerability of High, Medium, or Low to each 6th level hydrologic unit (HUCS) in western North Carolina containing National Forest System land:

Drainage Density	Area of grids (100 sq. mi.) with streams or lake

	shoreline divided by watershed area
Erodible Soils	Percent of watershed with S 0.5*k>1.20 (based on STATSGO data, which is a state-by-state summarization of soil associations)
Water Supply Watersheds	Number of drinking water sources in the watershed
Total Native Fish Species	Total number of native fish species found in the watershed
Riparian Area in Forest or Wetland	Percent forested land use or wetland that borders streams and lakes within a watershed
Native fish species/Total fish	Number of native fish species divided by total number of species of fish species found in the watershed, expressed as a percentage
Outstanding Resource Waters (ORW's)	ORW streams etc. expressed as a percentage of total lake and stream area in each watershed.
State Impaired Lakes	Impaired lake surface area expressed as a percentage of total lake surface area in the watershed
State Impaired Streams	Miles of impaired stream in the watershed
Lake Area	Percent of watershed area occupied by lakes
Wetland Area	Percent of watershed area occupied by wetland

For the 143 6th level HUCS within the administrative boundary considered, 36 were rated as having low vulnerability, 78 rated moderate vulnerability, and 37 rated highly vulnerable.

V.5.3 WATERSHED AQUATIC BIOTA VULNERABILITY

While watershed vulnerability considered a variety of physical and biological information across the entire watershed, the aquatic biota vulnerability focuses more closely on National Forest System lands and the open roads within the watershed. Factors included: the amount of open roads, the number of stream crossings, the amount of roads paralleling streams, and trout populations. For this analysis, each of 134 6th level HUCS in western North Carolina that actually contain National Forest System lands was assigned a vulnerability rating of high, medium, or low. Figure IV-5 displays the results graphically. Of the 134 HUCs, 40 rated low vulnerability, 45 rated medium, and 49 rated high.

6

Key Findings and Recommendations

VI.1 KEY FINDINGS

Table VI-1 below provides a summary of the analysis presented in Chapter 5, *Describing Priorities and Setting Opportunities*. When summarized, the value factors and risk factors associated with individual roads paint a general picture of the state of the transportation system on the Forests and how it is being used.

Table VI-1. Road Information Summary: Value Factors and Risk Factors

VALUE FACTORS	Very High	High	Medium	Low
Existing Recreation Uses	*	198 roads (437 miles)	127 roads (291 miles)	99 roads (79 miles)
Existing Social Uses	*	225 roads (484 miles)	143 roads (273 miles)	56 roads (50 miles)
Timber Management Potential	*	137roads (593 miles)	108 roads (125 miles)	179 roads (88 miles)
Fire Management Potential	13 roads (65 miles)	135 roads (465 miles)	195 roads (245 miles)	81 roads (31 miles)
Relative Traffic Volume		99 roads (142 miles)	206 roads (413 miles)	119 roads (251 miles)
RISK FACTORS				
Fire Suppression Concerns	*	53 roads (183 miles)	184 roads (287 miles)	187 roads (337 miles)
Rare Species & Special Habitats Close to the Road	*	10 roads (51 miles)	124 roads (383 miles)	290 roads (372 miles)
Heritage Resources Close to the Road	*	82 roads (235 miles)	108 roads (220 miles)	234 roads (351 miles)
Public Safety Concerns	32 roads (112 miles)	141 roads (314 miles)	189 roads (310 miles)	62 roads (70 miles)
Aquatic Biota Vulnerability	*	68 roads (74 miles)	250 roads (434 miles)	106 roads (299 miles)
Wildlife Concerns	*	19 roads (94 miles)	130 roads (297 miles)	275 roads (425 miles)
Maintenance Costs	51 roads (97 miles)	152 roads (373 miles)	130 roads (207 miles)	91 miles 129 miles)
TOTAL OPEN ROADS = 424				
TOTAL OPEN ROAD MILES = 806				
TOTAL NP ACRES = 1,036,154				

*"Very High" ratings were only possible for the categories of fire management, public safety, and maintenance costs.

Figure VI-1 graphically displays the distribution of the "total values" of open roads on the Forests, relative to one another.

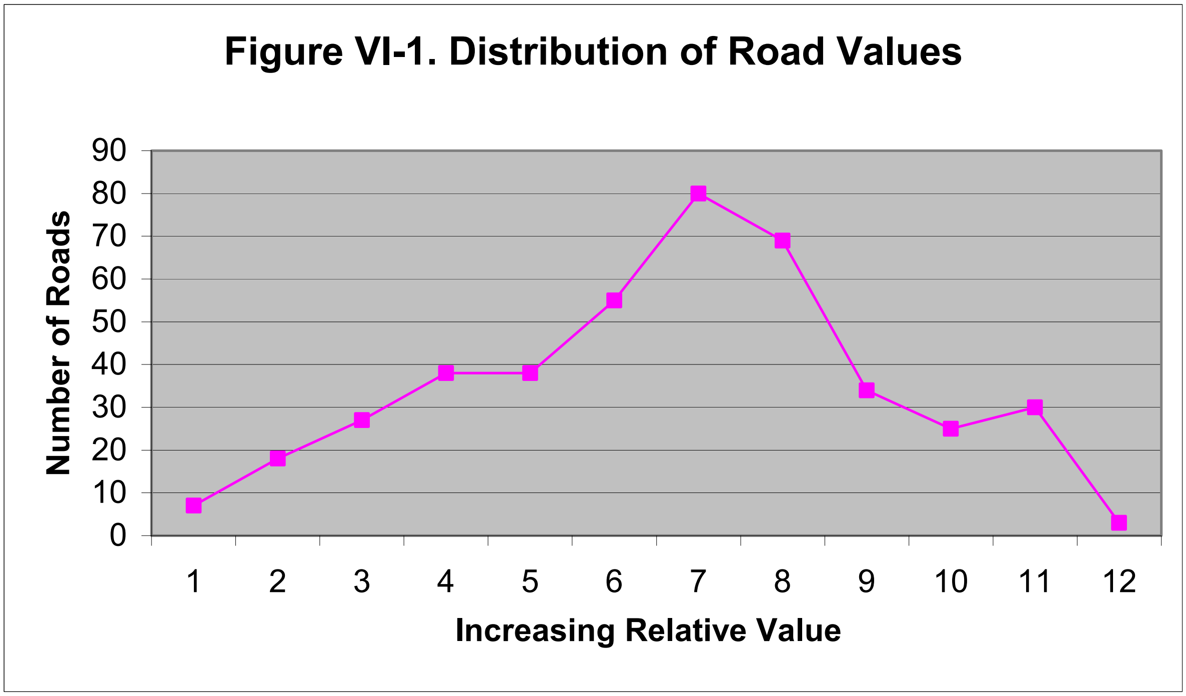
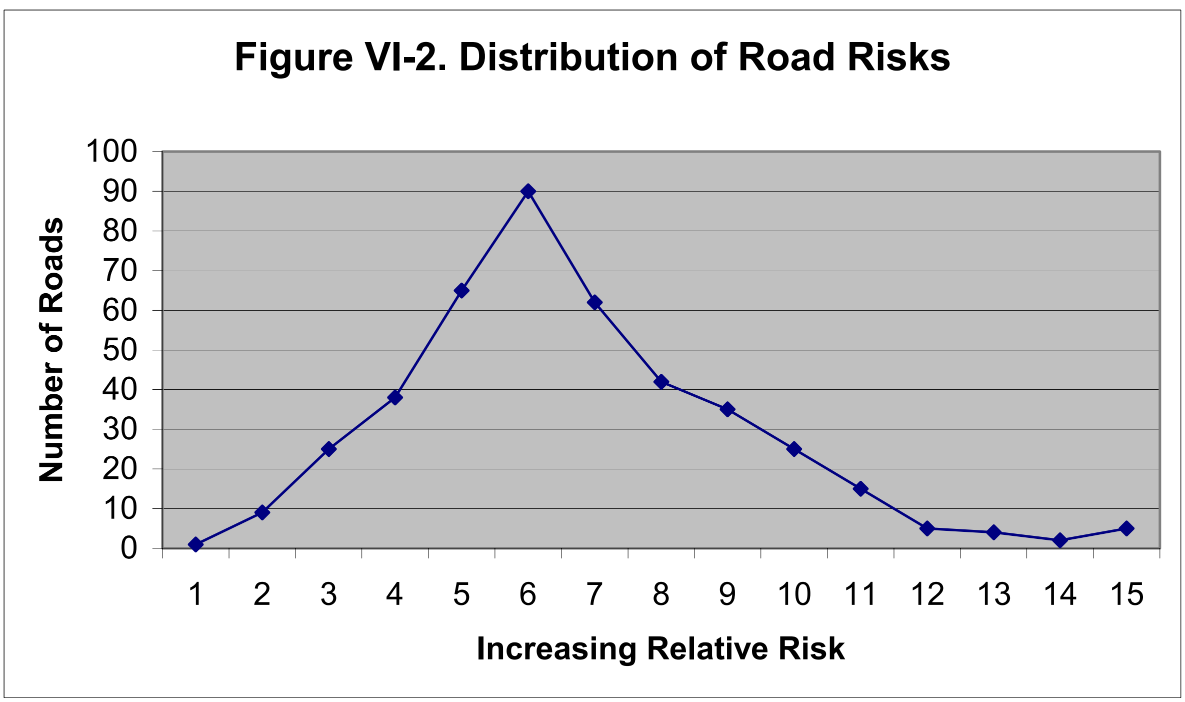


Figure VI-2 graphically displays the distribution of the "total risk" of open roads on the Forests, relative to one another.



- While no roads in this analysis were determined to be unneeded at this time, a number were identified as possible candidates for closure, seasonal closure, or reduced maintenance. These would be the roads with the lowest value scores, and especially those with a corresponding high risk score, that are not required to be open for specific reasons such as providing access to private property. To identify these roads, see Appendix A.

- More than half the open roads were identified as having high value for social uses. These range from providing access to cemeteries, churches and other ceremonial sites, to sustaining traditional uses for minority or low-income groups, to use as a thoroughfare connecting private land with state roads or federal highways.

- While most roads are viewed as having at least moderate value for fire management, a significant number are also perceived as not up to the task of handling the large, heavy vehicles associated with fire fighting in a completely safe manner. Many Forest roads have infrequent turnouts and few spots where a fire engine could turn around.

- Although open-road-density across the Forests is higher that anticipated in the LRMP, few roads are identified as posing a high risk to wildlife (the open road density standards are set primarily to benefit wildlife). In part, this is due to low traffic volumes on many of these roads.

- While only 2% of roads are in close proximity to a Threatened or Endangered Species, approximately 29% are close to at least one sensitive species or special habitat.

- Twenty percent of the roads are in close proximity to a heritage resource site. These are sites with paleontological, archeological, or historical significance.

- This analysis looked at the 806 miles classified as the open road system. However, impacts are occurring on the 2000+ miles of closed roads and on the estimated 700+ miles of unclassified roads. All unclassified roads will be identified using GPS technology and added to the Transportation Atlas in the next few years. Watershed scale analysis will look at both the closed and unclassified roads. Priorities for watershed scale analysis should consider those watersheds that are the most vulnerable and can benefit the most from road investments.

VI.2 RECOMMENDATIONS

For Forest Plan Revision

1. Use the watershed condition and vulnerability rating when making decisions regarding suitable uses and desired conditions:
   - It would be more appropriate to plan for a high level of use in watersheds of good or moderate condition and moderate or low vulnerability.
   - If possible, avoid planning for a high level of use in watersheds with high vulnerability.

2. Reconsider the need for open road density standards or convert them to desired conditions, and clarify how they are to be applied spatially.

Project Planning

1. Consider the watershed condition and vulnerability rating in project planning:

2. In GOOD condition, HIGH vulnerability watersheds, priority is for actions to reduce risks and/or solidify conditions, such as erosion control, revegetation, or other "restoration" methods to increase the stability and resilience of the watershed.

3. Check the value/risk ratings for all roads in the project analysis area to determine if there are significant concerns with any of the roads. Consider if these concerns can be addressed through project actions.

Recommendations for Addressing Watershed Condition and Vulnerability

<u>Priority #1. Very important for new road construction, reconstruction or heavy maintenance. Existing roads should be improved when possible.</u>

- Design roads to minimize interception, concentration, and diversion potential.
- Design measures to reintroduce intercepted water back into slow subsurface pathways.
- Use outsloping and drainage structures to disconnect road ditches from stream channels rather than delivering water in road ditches directly to stream channels.
- Evaluate and eliminate diversion potential at stream crossings.
- Increase the number and effectiveness of drainage structures on problem roads.
- If road impacts a wetland,, use measures to restore the hydrology of the wetland. Examples include raised prisms with diffuse drainage such as French drains.
- If road-stream crossings restrict migration and movement of aquatic organisms, replace the culvert to eliminate the limiting factor. Otherwise, reset the culvert with an alternative crossing such as bridge, hardened low-water ford, or bottomless arch culvert
- Restore the hydrology in riparian areas that has been altered by the road system and its drainage system when critical, such as in Threatened, Endangered, or Sensitive species habitat.

Priority #2.

- Improve the road surfaces at stream crossings by either gravelling, or adding a binding material to those roads that have native surfaces with no inherent binder.
- Design stream crossings to pass all potential products including sediment and woody debris, not just water.
- Realign stream crossings that are not consistent with the channel pattern.

- Change the type of stream crossing to better fit the situation; for example, consider bridges or hardened crossings on streams with floodplains, and consider bottomless arch culverts in place of round pipe culverts.
- Add cross-drains near road-stream crossings to reduce the connected disturbed area.
- Reduce the number of road-stream crossings to minimize the potential for adverse effects.
- If road impacts riparian plant communities, relocate road out of riparian area if possible.

Miscellaneous Recommendations

1. The NP RAP clearly demonstrated that annual maintenance funding is inadequate to maintain the road system on the Forests. The agency is addressing this issue nationally by proposing a new funding category for the fiscal year 2004 called Public Forest Service Roads (PFSR). A challenge for the Forests is determining how to prioritize the roads for the PFSR funding. The Road Matrix (Appendix A) revealed that some currently submitted PFSR project proposals are for roads that received a low value rating. The road matrix can be used as a prioritization tool for these proposals.

2. A Road Maintenance Management System should be developed that utilizes the priorities and recommendations in this report as a base for allocation of funds. Road condition surveys on the remaining unsurveyed Maintenance Level 3,4, and 5 roads should be completed as soon as possible.

3. The Forests should continue to pursue formal road maintenance agreements with the North Carolina Department of Transportation and with local homeowners interested in sharing maintenance of access roads to more efficiently use taxpayer funds.

4. Road Management Objectives need to be updated to reflect the findings of this roads analysis and to better document the possible resolution of conflicting road and forest plan objectives.

5. Inventory all Special Use permits dependant on the use of the transportation system and integrate data with GIS through Infra SUDS.

6. Inventory all land acquisitions for deed reservations and integrate data with GIS though ALP.

7. Prior to changing the status of a road, check inventory to determine if use of the road was authorized under a Special Use Permit or reserved through the deed. Work with the effected user to explore alternatives regarding the proposal to change the status of the road.

APPENDICES

Appendix A - Open Roads Value/Risk Matrix

FINAL RATING CATEGORY	Road Number	Name	Private Access/Major SU/Administrative Site*	Recreation Value	Social Value	Timber Management Value	Fire Management Value	Traffic Volume	TOTAL VALUE	Suppression Risk	Biological Diversity Risk	Heritage Resources Risk	Public Safety Risk	Aquatic Biota Vulnerability	Wildlife Risk	Maintenance Cost Risk	TOTAL RISK	BEGIN_TERMINI	Length	District
HVLR	1001	BOONE FORK R.A.		2	2	0	1	1	**6**	0	0	0	1	1	0	3	**5**	2055	0.593	Grandfather
HVLR	111	BIG CREEK		1	1	1	2	1	**6**	1	1	0	1	1	0	1	**5**	SR 1312	1.4	APP-French Broad
HVLR	113	MILL RIDGE		2	2	1	3	1	**9**	0	0	2	1	1	0	2	**6**	US 25-70	1	APP-French Broad
HVLR	116	MORTIMER R.A.		2	2	0	1	2	**7**	0	0	0	2	1	0	2	**5**	NC 90 FH 29	0.38	Grandfather
HVHR	1178	BULL PEN		2	2	2	2	2	**10**	2	1	1	3	1	2	3	**13**	SR 1603	4.8	Highlands
HVHR	118	BACK-IRISH CREEK	P	1	1	2	1	1	**6**	1	0	0	1	2	1	3	**8**	SR 1240	2.821	Grandfather
LVLR	1188	SUGAR COVE		1	0	0	1	0	**2**	1	0	0	1	1	0	2	**5**	NC 80	1.334	Grandfather
LVLR	1204	MORTIMER WORK CENTER	A	1	1	0	1	1	**4**	0	0	2	1	0	0	1	**4**	SR 1328	0.2	Grandfather
HVHR	1206	YELLOW GAP		2	2	2	2	2	**10**	1	2	2	2	1	2	2	**12**	SR 1345	13.1	Pisgah
HVHR	130	ROAN MOUNTAIN		2	2	0	1	2	**7**	0	2	2	1	1	0	2	**8**	SR 1348	0.936	APP-Toecane
LVLR	139	OGREETA CEMETERY		0	2	1	1	0	**4**	0	0	0	1	1	0	1	**3**	SR 1326	0.5	Tusquitee
LVLR	139A	OGREETA SPUR		2	0	0	1	0	**3**	0	0	0	1	0	0	2	**3**	FDR 139	0.1	Tusquitee
HVHR	140	COURTHOUSE CR		1	1	2	2	1	**7**	2	1	1	2	2	1	2	**11**	NC 215	3.35	Pisgah
HVHR	142	H'VILLE RESERVOIR	S	2	1	1	1	1	**6**	1	1	1	2	1	1	3	**10**	FDR 5000	0.5	Pisgah
HVLR	148	COLD SPRINGS		2	2	2	1	1	**8**	0	1	1	2	1	0	2	**7**	SR 1182	6.095	APP-French Broad
HVLR	148A	BROWN GAP		1	1	2	2	1	**7**	0	0	1	2	1	0	3	**7**	FDR 148	1.235	APP-French Broad

FINAL RATING CATEGORY	Road Number	Name	Private Access/Major SU/Administrative Site*	Recreation Value	Social Value	Timber Management Value	Fire Management Value	Traffic Volume	TOTAL VALUE	Suppression Risk	Biological Diversity Risk	Heritage Resources Risk	Public Safety Risk	Aquatic Biota Vulnerability	Wildlife Risk	Maintenance Cost Risk	TOTAL RISK	BEGIN_TERMINI	Length	District
LVLR	148H	HORSE CAMP		2	2	0	0	1	**5**	0	0	0	1	1	0	2	**4**	FDR 148	0.05	APP-French Broad
HVLR	160	PINK BEDS PICNIC AREA		2	2	1	1	2	**8**	0	1	2	1	0	1	2	**7**	US 276	0.1	Pisgah
HVLR	161	CAROLINA HEMLOCKS		2	2	1	0	1	**6**	0	1	0	1	0	0	0	**2**	NC 80 FH 5	0.987	APP-Toecane
LVHR	162	SILVERMINE		1	1	0	1	0	**3**	0	1	2	2	1	0	2	**8**	CITY ST.	0.4	APP-French Broad
HVHR	187	MAPLE-SALLY		1	2	2	2	1	**8**	1	1	2	1	1	1	2	**9**	SR 1357	17.115	Grandfather
HVLR	192	ROSEBORO GRAGG		1	1	2	1	1	**6**	1	1	0	1	2	0	2	**7**	FDR 981	6.542	Grandfather
HVHR	197	RAVEN CLIFF		2	2	1	1	1	**7**	1	1	1	2	1	0	2	**8**	FDR 982	1.488	Grandfather
HVLR	2055	BOONE FORK		2	2	1	1	1	**7**	0	1	0	1	1	0	2	**5**	SR 1368	1.976	Grandfather
HVLR	2070	FISHING ACCESS		2	1	2	1	1	**7**	0	0	1	2	0	0	1	**4**	SR 1326	0.1	Tusquitee
HVLR	2071	CHAMBERS CREEK		0	2	2	2	0	**6**	0	0	2	1	1	0	2	**6**	SR1316	2.1	Tusquitee
HVLR	2074	NEALS CREEK		1	2	2	2	1	**8**	0	0	1	2	1	0	2	**6**	FDR 472	2.417	APP-Toecane
HVLR	210	ROSES CREEK	S	2	2	2	2	2	**10**	0	1	0	3	1	0	2	**7**	SR 1263	13.434	Grandfather
HVHR	210B	RICH COVE		2	2	1	2	2	**9**	0	1	0	3	1	1	2	**8**	FDR 210	1.503	Grandfather
LVLR	223	PUNCHEON CAMP		1	0	2	2	0	**5**	1	0	0	1	1	0	1	**4**	NC 209	2.2	APP-French Broad
HVHR	225	COVE CREEK		1	2	2	2	1	**8**	2	1	1	2	1	1	2	**10**	FDR 475B	2.5	Pisgah
HVHR	228	STEELES CREEK		2	2	2	2	1	**9**	2	0	2	3	1	0	1	**9**	NC 181	3.871	Grandfather
HVHR	229	PILOT MTN.		1	1	2	2	1	**7**	2	1	1	2	0	1	2	**9**	FDR 475	2.7	Pisgah
LVLR	231	LOWER STAIRE	P	0	0	0	0	1	**1**	0	1	0	2	1	1	2	**7**	FDR 74	0.56	APP-Toecane
LVLR	2320	FRANK ROGERS	P	0	1	0	1	1	**3**	0	0	0	1	1	0	2	**4**	SR 143	0.5	Cheoah

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LVLR	2321	CLYDE DAVIS	P	0	1	0	1	1	**3**	0	0	0	1	1	0	1	**3**	FDR 446/MASSEY QUARRY	0.25	Cheoah
LVLR	2322	LEWIS	P	0	1	0	1	1	**3**	0	0	0	1	0	0	0	**1**	FDR 446/MASSEY QUARRY	0.2	Cheoah
LVLR	233	HAYNES		1	1	1	1	1	**5**	2	0	1	0	2	0	0	**5**	FDR 3571	6.1	APP-French Broad
HVHR	235	PIGEONROOST		0	1	2	2	1	**6**	0	1	2	2	2	0	2	**9**	SR 1349	3.032	APP-Toecane
HVLR	2369	BLUE BOAR	P	1	1	2	2	2	**8**	1	0	1	1	1	1	2	**7**	SR 143	1	Cheoah
HVLR	2369A	BLUE BOAR LODGE	P	1	1	1	1	2	**6**	1	0	2	1	1	1	1	**7**	SR 143	0.7	Cheoah
LVLR	2370	TEEOATLAH BRANCH	PS	0	1	0	1	0	**2**	1	1	1	1	0	0	2	**6**	SR 143	0.15	Cheoah
LVLR	2387	ELLER BRANCH	P	0	0	0	1	0	**1**	1	0	1	0	0	0	2	**4**	FDR 383	0.3	Cheoah
LVLR	239	LOCUST CREEK		0	0	1	0	0	**1**	1	0	0	0	1	0	0	**2**	NC 80 FH 5	0.7	APP-Toecane
HVLR	2409	AVEY BR BOAT RAMP		2	2	0	1	2	**7**	0	0	0	1	1	0	1	**3**	SR 1134	0.1	Cheoah
LVLR	2410	AVEY CREEK		0	0	1	0	0	**1**	1	0	0	0	0	0	0	**1**	SR 1134	0.1	Cheoah
LVLR	2411	AVEY CAMP		0	1	0	1	0	**2**	0	0	0	0	0	0	1	**1**	SR 1134	0.1	Cheoah
LVLR	2412	ATTOOGA BR. CAMP		1	0	0	1	0	**2**	1	0	1	0	0	0	1	**3**	SR 1134	0.15	Cheoah
HVLR	248	JACKRABBIT MTN		2	2	2	1	1	**8**	0	0	2	2	0	0	0	**4**	SR 1155	2.7	Tusquitee
HVLR	248A	LOOP A		2	2	0	1	1	**6**	0	0	0	2	0	0	3	**5**	FDR 248	0.4	Tusquitee
HVLR	248B	LOOP B		2	2	0	1	1	**6**	0	0	0	2	0	0	3	**5**	FDR 248	0.4	Tusquitee
HVLR	248C	LOOP C		2	2	0	1	1	**6**	0	0	2	2	0	0	1	**5**	FDR 248	0.2	Tusquitee

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HVLR	248D	BOAT RAMP		2	2	0	1	1	**6**	0	0	0	2	0	0	3	**5**	FDR 248	0.2	Tusquitee
HVLR	248E	BEACH		2	2	0	1	1	**6**	0	0	1	2	0	0	3	**6**	FDR 248	0.2	Tusquitee
HVLR	248F	MCCLURE ROAD	P	1	2	0	2	1	**6**	0	0	2	1	0	0	0	**3**	FDR 248	0.54	Tusquitee
LVLR	2519	FARLEY CEMETERY	P	0	2	1	1	1	**5**	1	0	2	1	1	0	1	**6**	SR 1247	0.9	Cheoah
LVLR	2524	FAX BRANCH RIDGE		0	0	0	1	0	**1**	1	0	0	0	0	0	0	**1**	SR 1246	0.1	Cheoah
LVLR	2535	BROOKSHIRE	P	0	1	0	1	0	**2**	0	1	0	0	0	0	2	**3**	FDR 2536A	0.5	Cheoah
LVLR	2536A	HYDE FARM	P	0	0	1	1	1	**3**	0	1	0	1	1	0	2	**5**	SR 1242	0.54	Cheoah
LVLR	2536D	LOWER TUSKEEGEE	P	0	1	0	1	0	**2**	0	0	1	1	1	0	2	**5**	FDR 2536A	0.1	Cheoah
HVLR	2537	LOWER STECOAH CR	P	0	1	2	2	1	**6**	1	0	1	1	1	0	2	**6**	SR 1236	0.3	Cheoah
HVLR	2550	COUNTY LINE ROAD		2	2	2	2	2	**10**	0	0	2	2	0	1	2	**7**	SR 1286	0.2	Cheoah
HVLR	2553	LEMMONS BRANCH		2	2	1	1	2	**8**	0	0	2	1	1	0	1	**5**	SR 1286	1.469	Cheoah
LVLR	256	BIG EAST FORK		2	2	0	0	1	**5**	0	1	1	2	0	1	1	**6**	US 276 & FH 38	0.1	Pisgah
HVHR	257	SYCAMORE FLATS REC AREA		2	2	0	1	2	**7**	0	1	1	3	1	1	3	**10**	US 276	0.3	Pisgah
HVHR	258	SUNBURST REC AREA		2	2	0	1	1	**6**	0	0	2	3	1	1	1	**8**	NC 215	0.3	Pisgah
HVLR	2586	LONG HUNGRY BRANCH		2	2	2	2	1	**9**	0	0	1	1	1	0	1	**4**	SR 143	2.7	Cheoah
HVLR	2590	CHEOAH PT BOAT RAMP		2	2	0	1	2	**7**	0	0	2	1	0	1	1	**5**	SR 1147	0.1	Cheoah
HVLR	2591	CHEOAH POINT SWIMMING/PICNIC		2	2	0	0	2	**6**	0	0	0	1	0	1	2	**4**	SR 1147	0.07	Cheoah
LVLR	2598	MCKELDRY	S	1	1	0	0	1	**3**	1	0	0	1	0	0	0	**2**	SR 143	0.1	Cheoah

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LVLR	2599	HELICOPTER PAD	A	0	0	0	1	0	**1**	0	0	0	0	0	0	2	**2**	SR 143	0.3	Cheoah
LVLR	260	TULALAH RAILROAD		0	0	1	1	0	**2**	0	1	0	0	1	0	0	**2**	SR 1200	1	Cheoah
LVLR	2600	WORK CENTER	A	0	1	1	1	1	**4**	1	0	0	1	1	0	1	**4**	SR 143	0.2	Cheoah
LVLR	2608	GREEN GAP	P	0	0	0	1	1	**2**	1	0	0	1	1	0	3	**6**	NC 143	0.2	Cheoah
HVLR	2632	WATIA	P	1	1	2	1	1	**6**	1	0	2	1	1	0	2	**7**	SR 1121	0.687	Cheoah
LVLR	2635	ROSE PLACE		0	1	0	1	0	**2**	2	1	0	0	1	0	0	**4**	SR 1232	0.8	Cheoah
HVHR	264	LITTLE EAST FORK		2	2	0	2	1	**7**	2	1	1	2	1	1	2	**10**	SR 1129	0.3	Pisgah
HVLR	275	SUGARLOAF MOUNTAIN	S	2	1	2	2	0	**7**	2	1	0	1	1	0	2	**7**	NC 212	1.2	APP-French Broad
LVLR	2800	LOWER HOOPER COVE		0	1	1	0	0	**2**	2	0	0	0	1	0	0	**3**	FDR81	0.27	Cheoah
LVLR	2807	MCGUIRES CABIN		0	2	0	0	1	**3**	2	0	0	1	0	0	1	**4**	NC 143	0.3	Cheoah
LVLR	2811	WOLF LAUREL HUNTER CAMP		1	1	0	1	0	**3**	1	0	2	1	0	0	2	**6**	FDR 81F	0.1	Cheoah
LVLR	286	REDMAN		0	1	2	2	0	**5**	1	0	2	1	1	0	2	**7**	I-40	2.368	APP-French Broad
LVHR	287	LONGARM		0	1	2	1	1	**5**	1	0	1	1	1	2	2	**8**	FDR 288	2.9	APP-French Broad
HVHR	288	BUZZARD ROOST	P	1	1	2	2	1	**7**	1	1	1	2	2	1	2	**10**	I-40	11.109	APP-French Broad
LVLR	289	OLD BUZZARD ROOST		0	1	1	2	0	**4**	1	0	1	1	1	0	0	**4**	SR 1397	2	APP-French Broad
HVHR	294	N. MILLS RIVER REC AREA		2	2	1	1	1	**7**	1	1	2	2	1	1	1	**9**	FDR 1206	0.9	Pisgah
HVLR	294A	SOUTH LOOP A		2	2	0	1	1	**6**	0	1	1	2	1	1	1	**7**	FDR 1206	0.4	Pisgah
LVLR	294B	NORTH LOOP B		2	2	0	0	1	**5**	0	1	1	2	1	1	1	**7**	FDR 1206	0.2	Pisgah
HVHR	297	TURKEYPEN		2	2	0	2	2	**8**	2	1	1	3	1	2	2	**12**	SR 280	1.5	Pisgah

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HVLR	298	CHECK STA.		2	2	1	0	1	**6**	0	1	1	1	1	1	2	**7**	US 276	0.7	Pisgah
HVHR	299	BROWN MOUNTAIN		2	2	2	2	2	**10**		1	2	2	2	1	2	**10**	SR 1405	0.9	Grandfather
HVHR	301	WILSON LAKE		2	2	1	1	1	**7**	0	1	2	2	1	0	2	**8**	FDR 79	0.75	Highlands
HVLR	304	WEBB MILL		2	2	2	2	1	**9**	0	0	0	3	1	0	1	**5**	SR 1388	10.4	Tusquitee
LVLR	304A	MOODY STAMP	P	0	2	1	1	0	**4**	1	0	2	0	1	0	0	**4**	FDR 304	1.21	Cheoah
LVLR	304A1	POPLAR SPRINGS	P	0	2	1	1	0	**4**	1	0	0	1	1	1	0	**4**	FDR 304A	1.6	Cheoah
HVLR	307	BEECH CREEK		2	1	2	1	1	**7**	0	0	1	1	1	1	2	**6**	SR 1303	10	Tusquitee
HVLR	307A	SEED ORCHARD		1	2	2	2	0	**7**	0	0	0	1	1	1	2	**5**	FDR 307	2.1	Tusquitee
HVLR	307A1	SANDY GAP	P	1	2	2	2	0	**7**	1	0	0	1	0	1	0	**3**	FDR 307A	1	Tusquitee
HVHR	308	BEACHERTOWN		2	2	2	2	2	**10**	0	0	0	3	1	2	3	**9**	SR 1401	3.4	Wayah
HVHR	313	LAKE CHEROKEE		2	2	1	1	2	**8**	0	0	1	3	1	1	2	**8**	NC 294	0.6	Tusquitee
HVHR	316	LOCUST TREE		2	2	1	2	1	**8**	1	1	0	2	2	0	2	**8**	SR 1310	0.3	Wayah
LVLR	317	RATTLER FORD		0	0	1	1	1	**3**	0	1	2	1	1	0	2	**7**	SR 1127	0.9	Cheoah
HVHR	319	TUSQUITEE OFFICE		2	2	0	1	2	**7**	0	0	2	2	1	1	3	**9**	SR 1556	0.2	Tusquitee
LVLR	319A	RANGER RESIDENCE	A	0	2	0	1	0	**3**	0	0	0	1	0	0	2	**3**	FDR 319	0.05	Tusquitee
LVLR	320	MURPHY R/W		0	2	2	1	0	**5**	0	0	0	2	0	0	2	**4**	OLD MOURHY HWY	0.75	Tusquitee
HVLR	321	RANGER OFFICE		2	2	0	1	2	**7**	0	0	0	1	1	1	1	**4**	SR 143	0.2	Cheoah
HVLR	322	VAN HOOK		2	2	0	0	2	**6**	0	0	1	3	0	1	1	**6**	US 64 SH 28	0.3	Highlands

FINAL RATING CATEGORY	Road Number	Name	Private Access/Major SU/Administrative Site*	Recreation Value	Social Value	Timber Management Value	Fire Management Value	Traffic Volume	TOTAL VALUE	Suppression Risk	Biological Diversity Risk	Heritage Resources Risk	Public Safety Risk	Aquatic Biota Vulnerability	Wildlife Risk	Maintenance Cost Risk	TOTAL RISK	BEGIN_TERMINI	Length	District
HVHR	323	FLAT BRANCH		1	1	2	2	1	**7**	2	0	2	2	1	0	2	**9**	SR 1001	4.2	Highlands
LVLR	325	BRYSON BRANCH	P	0	0	1	1	0	**2**	1	1	0	1	2	1	1	**7**	FDR 323	1	Highlands
LVLR	326	WILDCAT CREEK	P	1	1	0	1	1	**4**	1	0	0	1	0	0	2	**4**	FDR 323 AT MOSS GAP	0.4	Highlands
HVLR	328	WHITE WATER FALLS		2	2	0	0	2	**6**	1	0	0	2	0	1	1	**5**	SR 281	0.4	Highlands
LVLR	330	RANGER RESIDENCE		1	1	0	1	1	**4**	0	0	0	1	1	0	1	**3**	SR 143	0.1	Cheoah
LVLR	331	HIGHLANDS W.C.	A	0	0	0	0	1	**1**	0	0	0	2	0	0	3	**5**	SR 1544	0.2	Highlands
LVLR	332	HIGHLANDS OFFICE COMPLEX		2	2	0	0	1	**5**	0	0	0	2	0	0	3	**5**	SR 1544	0.2	Highlands
LVLR	333A	HICKEY	P	0	2	1	1	1	**5**	0	0	1	1	1	0	1	**4**	SR 1324	0.7	Tusquitee
HVLR	333A2	BURCH	P	0	2	1	2	1	**6**	0	0	2	0	0	0	2	**4**	FDR 333A	0.7	Tusquitee
LVLR	333B	ANDERSON CR.	P	0	2	1	1	0	**4**	1	0	0	0	1	0	0	**2**	SR 1324	0.6	Tusquitee
LVLR	335	RANGER RESIDENCE	A	0	0	0	0	0	**0**	0	0	0	0	1	0	2	**3**	NC 28 FH 2	0.1	Highlands
HVHR	340	FIRES CREEK		2	2	2	2	2	**10**	0	1	1	2	2	1	2	**9**	SR 1344	12.4	Tusquitee
HVLR	340A	ROCKHOUSE BR.		1	1	1	2	1	**6**	1	1	1	1	2	0	1	**7**	FDR 340	1.8	Tusquitee
LVLR	340A1	PHILLIPS RIDGE		0	0	2	1	0	**3**	1	0	0	1	2	0	1	**5**	FDR 340A	3.5	Tusquitee
HVLR	340C	LONG BRANCH		1	1	2	1	1	**6**	0	1	0	2	1	0	1	**5**	FDR 340	3.8	Tusquitee
HVLR	340E	PICNIC LOOP		2	2	0	1	2	**7**	0	0	0	2	1	0	3	**6**	FDR 340	0.1	Tusquitee
LVLR	340G	HUNTERS CAMP		2	2	0	0	1	**5**	0	0	0	2	1	0	2	**5**	FDR 340	0.25	Tusquitee
LVLR	340H	HUSKINS BRANCH	P	0	0	0	2	0	**2**	0	0	1	0	1	0	2	**4**	FDR 340G	0.4	Tusquitee

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HVLR	340N	HUNTERS WAY		2	2	0	2	1	**7**	2	0	2	0	1	0	1	**6**	FDR 340	0.3	Tusquitee
LVLR	340P	BAPTIZING HOLE		2	2	0	0	1	**5**	1	0	1	1	1	0	1	**5**	FDR 340	0.05	Tusquitee
HVLR	340R	WELL HOUSE		2	2	0	2	1	**7**	1	0	0	1	1	0	2	**5**	FDR 340	0.1	Tusquitee
LVLR	340U	BOTTOM CAMP		2	2	0	0	1	**5**	1	0	0	1	1	0	1	**4**	FDR 340	0.25	Tusquitee
LVLR	340V	GRASS PATCH		2	2	0	0	1	**5**	1	0	0	1	1	0	2	**5**	FDR 340	0.18	Tusquitee
LVLR	340W	HORSE CAMP		2	2	0	0	1	**5**	1	0	0	1	1	0	1	**4**	FDR 340	0.15	Tusquitee
LVLR	340X	BRISTOL CABIN		2	2	0	0	1	**5**	1	0	0	1	1	0	1	**4**	FDR 340	0.15	Tusquitee
LVLR	340Y	BRISTOL FIELD OVERFLOW		2	2	0	0	1	**5**	1	0	0	1	1	0	1	**4**	FDR 340	0.1	Tusquitee
LVLR	340Z	MULE FLATS		2	2	0	0	1	**5**	1	0	0	1	1	0	1	**4**	FDR 340	0.15	Tusquitee
HVLR	348	OLD 64 HWY		2	2	2	2	1	**9**	1	1	0	2	2	0	1	**7**	NEW 64	2	Tusquitee
HVHR	350	PERRY GAP	P	1	2	2	2	0	**7**	1	1	2	1	1	1	2	**9**	OLD US 64	4	Tusquitee
HVLR	3505	CATPEN	P	1	2	2	2	0	**7**	2	0	0	1	2	1	0	**6**	SR 1182	5.4	APP-French Broad
HVLR	3505A	CATPEN EXT	P	1	1	2	2	0	**6**	1	0	2	1	1	1	0	**6**	FS 3505	1.3	APP-French Broad
LVLR	3506	BLUFF MT		1	0	1	2	0	**4**	1	0	1	0	2	1	1	**6**	FDR 3505	1.8	APP-French Broad
HVLR	350A	BUCK CREEK	P	2	2	1	2	1	**8**	1	0	1	1	1	0	2	**6**	FDR 350	0.6	Tusquitee
HVLR	351	NELSON RIDGE	P	2	2	2	2	1	**9**	1	1	0	1	1	0	2	**6**	SR 1330	6.5	Tusquitee
HVLR	3518	MURRAY BRANCH		2	2	0	1	1	**6**	0	1	0	2	1	0	2	**6**	SR 1304	0.1	APP-French Broad
LVLR	3520	FLAT BRANCH	S	1	0	1	1	0	**3**	1	0	0	0	1	0	0	**2**	FDR 289	1.5	APP-French Broad
LVLR	3520A	SANDY JOHN RIDGE ROAD	PS	1	0	0	1	0	**2**	1	0	0	1	1	0	1	**4**	FDR 3520	0.15	APP-French Broad

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LVLR	3521	LAURELETT		0	0	1	0	0	**1**	1	0	0	0	1	0	0	**2**	OLD 289	0.8	APP-French Broad
LVLR	3523	LAUREL CREEK		0	1	0	1	0	**2**	1	0	0	0	2	0	0	**3**	FDR 289	0.3	APP-French Broad
LVLR	3537	SUTTON	S	1	0	1	2	0	**4**	2	1	1	1	0	0	0	**5**	FDR 288	1.17	APP-French Broad
LVLR	3538	SUTTON TOWER	S	1	2	0	2	0	**5**	0	0	0	1	0	0	2	**3**	FDR 3537	0.363	APP-French Broad
HVHR	3543	GARENFLO GAP	P	2	1	0	2	1	**6**	1	1	0	2	1	0	3	**8**	SR 1173	0.25	APP-French Broad
HVLR	3548	DOE BRANCH	P	1	1	2	2	0	**6**	1	0	0	1	1	0	1	**4**	SR 1152	4.5	APP-French Broad
HVLR	3548A	GLADDEN RIDGE		1	1	2	2	0	**6**	1	0	0	0	1	0	1	**3**	FS 3548	0.47	APP-French Broad
HVLR	3549	CATALOOCHEE	P	1	1	2	1	1	**6**	1	0	0	1	1	1	1	**5**	SR 1347	3.19	APP-French Broad
HVLR	3550	ROCKY BRANCH		1	1	2	1	1	**6**	1	0	0	1	1	0	2	**5**	SR 1152	0.6	APP-French Broad
LVLR	3564	WILKINS CREEK	P	1	1	1	2	0	**5**	1	0	1	1	1	0	2	**6**	FDR 286	0.619	APP-French Broad
LVLR	3567	HADECEK	P	1	0	1	2	0	**4**	1	0	2	1	0	0	1	**5**	FDR 286	0.7	APP-French Broad
LVLR	3570	HURRICANE RIDGE		1	0	2	1	0	**4**	1	0	1	0	1	0	0	**3**	FDR 3526	5.4	APP-French Broad
LVLR	3571-1	HAYWOOD HURRICANE EXT		0	0	2	2	0	**4**	0	0	1	1	1	0	1	**4**	FDR 3571	1.1	APP-French Broad
LVLR	3573	HAYWOOD HURRICANE SPUR	P	0	1	2	2	0	**5**	0	0	0	1	1	0	0	**2**	FDR 3571	1.33	APP-French Broad
HVHR	367	LITTLE YELLOW MTN		1	2	2	2	1	**8**	2	0	1	2	1		2	**8**	FDR 79	4.9	Highlands
HVLR	383	ATOAH GAP	P	1	1	2	2	1	**7**	1	1	0	1	1	0	2	**6**	MP 0.1	1.198	Cheoah
HVHR	385	CORNSILK	P	1	1	2	2	1	**7**	1	0	2	1	1	0	3	**8**	SR 1119	0.8	Cheoah
HVLR	388	BOARDTREE		2	2	2	2	1	**9**	0	0	1	1	1	1	2	**6**	SR 1310	5.2	Wayah
LVLR	4008	GOOD CEM		0	1	1	1	0	**3**	1	0	0	2	0	0	3	**6**	SR 1439	0.82	Grandfather

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HVHR	401	RICH GAP		1	2	2	1	2	**8**	1	0	2	2	1	1	2	**9**	SR 1710	4.4	Highlands
LVLR	402	BIG OAK	P	0	0	0	0	1	**1**	1	0	0	1	1	1	0	**4**	FDR 420-2	0.3	Tusquitee
HVLR	406	THREE FORK GAP	P	1	2	1	2	0	**6**	1	0	0	1	1	0	2	**5**	SR 1326	1.5	Tusquitee
HVLR	407	FARLEY COVE		1	1	2	2	1	**7**	1	0	0	1	1	0	2	**5**	SR 1127	5.45	Cheoah
HVHR	4071	THUNDERHOLE		1	1	2	2	1	**7**	1	1	0	3	1	1	3	**10**	SR 1367	2.5	Grandfather
LVLR	409	HORSE COVE R. A.		1	1	0	0	1	**3**	0	0	0	1	1	0	1	**3**	FDR 416	0.2	Cheoah
LVLR	412	DRY FALLS RESIDENCE	S	0	1	1	1	0	**3**	1	0	0	1	0	0	1	**3**	US 64 FH 28	0.6	Highlands
HVHR	415	LEE CREEK	P	1	2	2	2	1	**8**	1	0	2	2	2	1	2	**10**	SR 1130	2.227	Wayah
HVLR	416	JOYCE KILMER		2	2	0	1	2	**7**	0	0	1	1	1	1	1	**5**	SR 1127	0.6	Cheoah
HVHR	418	SHELL STAND	P	1	1	2	2	2	**8**	1	1	0	1	2	1	2	**8**	SR 1268	1.358	Cheoah
HVLR	42	CAMP CREEK BALD	S	1	2	0	2	1	**6**	0	0	0	1	0	0	1	**2**	Cherokee NF Road # 42	0.8	APP-French Broad
HVHR	420	DAVIS CREEK		2	2	2	2	2	**10**	0	1	2	3	2	1	1	**10**	SR 1337	3.9	Tusquitee
HVHR	420-1	TRAIL 1		2	2	2	2	2	**10**	0	1	2	2	2	1	1	**9**	FS 420 (ALAN GAP)	6	Tusquitee
HVLR	420-11	CHESTNUT MOUNTAIN		2	2	2	2	2	**10**	1	0	0	2	1	1	0	**5**	FDR 420-3	1.5	Tusquitee
HVLR	420-12	HAWK KNOB		2	2	2	2	2	**10**	1	0	0	2	1	1	0	**5**	FDR 420-3	1.2	Tusquitee
HVHR	420-2	TIPTON KNOB	P	2	2	2	2	2	**10**	2	0	2	2	1	1	0	**8**	FDR 420-1	3.3	Tusquitee
HVLR	420-3	BEAR PEN		2	2	2	2	2	**10**	2	0	0	2	2	1	0	**7**	FDR 420-4	2.5	Tusquitee
HVHR	420-4	FAIN FORD		2	2	2	2	2	**10**	2	1	0	2	2	1	0	**8**	FDR 420-1	4.7	Tusquitee

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HVHR	420-5	TELLICO RIVER		2	2	2	2	2	**10**	2	0	2	2	2	1	0	**9**	FDR 420-1	1.5	Tusquitee
HVLR	420-6	STATE LINE		2	2	2	2	2	**10**	2	0	0	2	1	1	0	**6**	FDR 420-1	4.6	Tusquitee
HVLR	420-7	PECKERWOOD		2	2	0	2	2	**8**	2	0	0	2	1	1	0	**6**	FDR 420-4	1.2	Tusquitee
HVLR	420-8	BOB CREEK		2	2	2	2	2	**10**	1	0	0	2	2	1	0	**6**	FDR 420-4	4.7	Tusquitee
HVLR	420-9	MISTLETOE		2	2	1	1	2	**8**	2	0	0	2	1	1	0	**6**	FDR 420-8	1.1	Tusquitee
LVLR	420A	DOGTOWN		0	0	1	0	0	**1**	2	0	0	1	2	0	0	**5**	FDR 420	0.25	Tusquitee
LVLR	421	DRYMAN FORK		1	1	1	1	1	**5**	1	1	0	2	1	0	2	**7**	FDR 83	3.995	Wayah
LVLR	421A	COLD SPRINGS GAP		1	1	0	1	1	**4**	0	0	0	2	0	0	3	**5**	FDR 421	0.9	Wayah
HVLR	422	WINDING STAIRS		2	2	0	1	1	**6**	2	1	0	1	1	0	2	**7**	SR 1100	3.051	Wayah
HVLR	423	TATHAM GAP		2	2	2	2	2	**10**	1	0	2	1	1	0	2	**7**	SR 1110	7.681	Tusquitee
HVLR	423B	JOANNA TOWER	S	0	2	2	1	1	**6**	0	0	2	1	1	0	1	**5**	FDR 423	2.994	Cheoah
HVLR	424	STANDING INDIAN		2	2	1	1	1	**7**	0	1	1	1	1	0	2	**6**	FDR 67	0.5	Wayah
HVLR	424A	STANDING INDIAN LOOP A		2	2	0	1	1	**6**	0	1	1	1	1	0	1	**5**	FDR 424	0.3	Wayah
HVLR	424B	STANDING INDIAN LOOP B		2	2	0	1	1	**6**	0	0	1	1	1	0	0	**3**	FDR 424	0.3	Wayah
HVLR	424C	STANDING INDIAN LOOP C		2	2	0	1	1	**6**	0	0	1	1	1	0	0	**3**	FDR 424	0.3	Wayah
LVLR	424C1	KIMSEY CREEK GROUP CAMP	A	0	0	0	1	1	**2**	0	0	1	1	1	0	0	**3**	FDR 424C	0.2	Wayah
LVLR	424D	STANDING INDIAN LOOP D		2	2	0	1	0	**5**	0	0	2	2	1	0	2	**7**	FDR 424	0.4	Wayah
HVLR	424E	STANDING INDIAN LOOP E		2	2	0	1	1	**6**	0	0	1	2	1	0	0	**4**	FDR 424	0.2	Wayah
HVLR	424F	STD. INDIAN PICNIC LOOP		2	2	0	1	1	**6**	0	1	0	1	1	0	3	**6**	FDR 424	0.1	Wayah

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LVLR	427	BIG STAMP		1	0	1	2	1	**5**	2	0	2	1	2	0	0	**7**	FDR 340 C	1.2	Tusquitee
HVLR	427A	BRUSHY RIDGE		1	1	1	2	1	**6**	2	0	0	0	1	0	3	**6**	FDR 427	1.1	Tusquitee
HVLR	433	HOMESITE	PS	1	2	1	1	1	**6**	0	0	0	1	1	0	2	**4**	SR 1326	0.8	Tusquitee
LVLR	436	DOC STILES		0	1	1	1	0	**3**	0	1	0	1	1	0	1	**4**	FDR 435	1.7	Tusquitee
HVHR	437	RAINBOW SPRINGS	P	2	2	2	3	2	**11**	0	1	1	2	2	1	3	**10**	US 64	12.405	Wayah
HVLR	440	TUNI GAP	P	2	2	2	2	2	**10**	0	1	0	2	1	0	2	**6**	SR 1311	5.7	Tusquitee/Wayah
HVLR	440A	BOB ALLISON		2	2	0	1	1	**6**	0	0	1	2	0	0	3	**6**	FDR 440	0.1	Tusquitee
LVLR	441	AMMONS		2	2	0	0	0	**4**	1	0	0	2	1	0	3	**7**	FDR 1178	0.2	Highlands
HVLR	445	DEEP CREEK		1	2	2	2	1	**8**	1	0	0	1	2	1	2	**7**	FDR 62	1.9	Cheoah
HVLR	446	MASSEY QUARRY	S	2	2	2	1	2	**9**	0	0	0	1	1	1	0	**3**	SR 143	0.3	Cheoah
HVHR	45	WATAUGA TURNPIKE	P	2	2	2	2	2	**10**	0	0	1	2	1	1	3	**8**	NC 90 FH29	4.556	Grandfather
LVLR	4503	HOWARD GAP	P	1	1	1	1	0	**4**	1	0	0	1	1	0	1	**4**	NC 106	1.5	Highlands
HVLR	451	MARKS MOUNTAIN		1	1	2	2	1	**7**	1	0	0	1	1	0	1	**4**	FDR 981	2.78	Grandfather
LVLR	452	BALD MTN R.A.		1	1	1	1	1	**5**	0	0	0	2	1	0	2	**5**	US 19 W FH 17	0.249	APP-Toecane
LVLR	4522	JONES GAP		1	1	1	1	1	**5**	0	0	0	1	0	1	2	**4**	SR 1678	2	Highlands
HVHR	454	SCHENCK CCC		1	2	2	2	1	**8**	2	2	1	1	1	1	1	**9**	FDR 803	1	Pisgah
HVLR	4542	WHITESIDE		2	2	0	0	2	**6**	0	0	0	3	0	1	3	**7**	SR 1600	0.1	Highlands
LVLR	4543	RATTLESNAKE ROAD	P	0	1	0	1	0	**2**	1	0	1	0	1	0	1	**4**	SR 1544	0.2	Highlands
LVLR	4549	SHORTOFF	P	1	1	1	1	1	**5**	1	0	0	1	1	1	2	**6**	SR 1540	1	Highlands

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LVLR	456	BARKHOUSE		2	2	0	0	1	**5**	1	0	0	2	0	0	2	**5**	NC 181	0.2	Grandfather
LVLR	4563	CHESTNUT MTN		1	1	0	1	1	**4**	1	0	1	1	0	0	2	**5**	FDR 1178	0.4	Highlands
LVLR	4567	BIG CREEK		1	1	1	1	1	**5**	1	0	1	1	1	0	1	**5**	SR 1710	2	Highlands
HVLR	458	WISEMANS VIEW		2	2	0	1	2	**7**	1	1	0	3	0	1	1	**7**	SR 1238	0.395	Grandfather
LVLR	460	OLD FORT		2	2	0	0	1	**5**	1	0	0	1	1	0	1	**4**	FH 21 OLD FORT	0.128	Grandfather
LVLR	4610	LEDFORD BRANCH	P	0	0	1	1	0	**2**	1	0	0	0	0	0	0	**1**	SR 1531	0.8	Highlands
LVLR	4616	WALKING STICK		1	1	1	1	0	**4**	1	0	1	0	1	0	1	**4**	SR 1606 & 1603	1.4	Highlands
LVLR	4621	EVANS CREEK	P	1	1	1	1	1	**5**	1	0	0	0	1	0	1	**3**	SR 1622	1.6	Highlands
LVLR	4624	COVEFIELD BR.		0	0	1	1	0	**2**	1	0	0	0	1	0	1	**3**	SR 1613	1.25	Highlands
LVLR	4625	GREEN COVE	PS	0	1	0	1	1	**3**	1	0	0	0	1	0	2	**4**	SR 1637	0.5	Highlands
HVLR	463	CHEOAH POINT R.A.		2	2	0	1	2	**7**	0	0	0	2	0	1	1	**4**	SR 1147	0.8	Cheoah
HVLR	464	EDGEMONT PINOLA		2	2	2	2	1	**9**	1	0	1	1	0	0	2	**5**	SR 1518	9.037	Grandfather
LVLR	4643	MULL CREEK		1	1	2	1	0	**5**	2	0	0	1	2	1	0	**6**	SR 1737	3	Highlands
LVLR	4644	COPPERMINE		1	1	2	1	0	**5**	1	0	0	1	0	2	0	**4**	FDR 4652	2.5	Highlands
LVLR	4646	CHASTINE CREEK	P	1	1	1	1	0	**4**	1	0	0	1	1		1	**4**	SR 1745 - Private Property	2	Highlands
LVLR	4648	GAGE CREEK	P	0	1	0	1	0	**2**	0	0	0	0	2	1	0	**3**	SR 1756	0.4	Highlands
HVLR	465	HICKEY FORK		1	1	2	1	1	**6**	1	1	0	1	2	1	1	**7**	SR 1310	3.75	APP-French Broad
HVHR	4650	WAYEHUTTA	P	2	2	1	1	2	**8**	1	0	1	3	2	1	1	**9**	SR 1731	0.9	Highlands

FINAL RATING CATEGORY	Road Number	Name	Private Access/Major SU/Administrative Site*	Recreation Value	Social Value	Timber Management Value	Fire Management Value	Traffic Volume	TOTAL VALUE	Suppression Risk	Biological Diversity Risk	Heritage Resources Risk	Public Safety Risk	Aquatic Biota Vulnerability	Wildlife Risk	Maintenance Cost Risk	TOTAL RISK	BEGIN_TERMINI	Length	District
HVHR	4651	MOSES CREEK	P	1	1	2	2	1	**7**	2	0	0	2	2	0	2	**8**	SR 1740	10	Highlands
LVLR	4651A	ROCK BRANCH ROAD	P	0	2	1	1	0	**4**	1	0	0	0	2	0	0	**3**	SR 1740	1	Highlands
LVLR	4651B	MOSES CREEK CAMP		0	1	0	0	0	**1**	1	0	0	1	2	0	1	**5**	FDR 4651	0.1	Highlands
LVLR	4651C	INDIAN CAMP	P	1	1	2	1	0	**5**	1	0	0	1	2	1	0	**5**	FDR 4651	4	Highlands
LVLR	4651C1	WEST FORK RIDGE		1	1	1	1	0	**4**	1	0	0	0	1	0	0	**2**	FDR 4651C	0.7	Highlands
LVLR	4651C3	BLACK MTN SPUR		1	1	1	1	0	**4**	1	0	0	1	0	1	0	**3**	FDR 4651C	0.5	Highlands
LVLR	4651C4	SHEEP MTN		1	1	1	1	0	**4**	1	0	0	0	1	0	0	**2**	FDR 4651C	1.5	Highlands
LVLR	4651D	MELTON PLACE ROAD		0	1	0	1	0	**2**	1	0	0	0	1	0	0	**2**	FDR 4651	0.3	Highlands
HVHR	4652	OLD BALD RIDGE		1	1	2	2	1	**7**	2	1	0	2	0	2	1	**8**	FDR 4651	7	Highlands
HVLR	4655	CHARLEY CREEK	P	1	1	2	2	0	**6**	2	0	0	1	2	2	0	**7**	SR 1756	6.9	Highlands
LVLR	4657	CARETAKER		2	2	0	0	1	**5**	0	1	0	2	1	0	1	**5**	SR 1756	0.1	Highlands
LVLR	4659	COLD CREEK		0	0	1	1	0	**2**	1	0	0	0	0	0	0	**1**	SR 1756	1.2	Highlands
HVHR	4662	FLAT CREEK		1	1	2	2	1	**7**	2	0	1	2	1	2	1	**9**	SR 1140	2.8	Highlands
HVHR	4663	COLD SPRING GAP		1	1	2	2	1	**7**	2	0	2	1	1	1	1	**8**	SR 215	6.7	Highlands
LVLR	4663A	HERRIN KNOB		1	1	0	1	1	**4**	0	0	1	1	1	1	1	**5**	FDR 4663	4	Highlands
LVLR	4663B	DILLS FALLS		1	1	1	1	0	**4**	1	0	1	0	1	1	0	**4**	FDR 4663	0.6	Highlands
HVHR	4665	SUGAR CREEK GAP		1	2	2	2	1	**8**	2	1	2	2	2	0	1	**10**	SR 1756	7.5	Highlands
LVLR	4666	PINEY MTN FLATS	P	1	1	0	2	1	**5**	2	1	0	0	2	1	1	**7**	FDR 4665	5.5	Highlands

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LVLR	4666A	HUNT CABIN	P	0	1	0	1	0	**2**	1	1	0	0	0	1	0	**3**	FDR 4666	0.4	Highlands
LVLR	4668	BEECH FLAT CREEK	P	1	1	0	1	0	**3**	1	0	2	0	2	1	0	**6**	SR 1737	2.4	Highlands
LVLR	4669	ROUGH BUTT	P	1	1	1	1	0	**4**	1	0	0	1	2	2	0	**6**	SR 1737	4	Highlands
LVLR	4669A	ROUGH BUTT CONNECTOR	P	1	1	0	1	0	**3**	1	0	0	1	0	1	0	**3**	FDR 4669	0.4	Highlands
HVHR	467	HURRICANE GAP		2	1	2	3	1	**9**	0	0	1	2	2	1	2	**8**	US 25-70	4.3	APP-French Broad
LVLR	4672	LAUREL FALLS	PS	0	1	0	1	1	**3**	1	0	0	0	0	0	2	**3**	SR 1121	1	Highlands
LVLR	4672A	LAUREL FALLS SPUR		0	1	0	0	0	**1**	1	0	0	1	0	0	0	**2**	FDR 4672	0.3	Highlands
LVLR	4674	HOGBACK ROAD	P	2	1	0	1	0	**4**	1	0	0	0	1	0	1	**3**	SR 1301	4	Highlands
HVLR	4674A	HOGBACK SPUR A		2	2	0	1	1	**6**	1	0	0	1	1	0	2	**5**	FDR 4674	0.2	Highlands
LVLR	4675	DRYLAND LAUREL BRANCH		1	1	2	1	0	**5**	1	1	0	0	1	1	0	**4**	SR 1747	3.5	Highlands
HVLR	467A	RICH MTN LOOK-OUT		1	1	1	3	1	**7**	0	1	1	1	0	0	1	**4**	FDR 467	1.6	APP-French Broad
HVLR	468	POLECAT HOLLER		1	1	1	2	1	**6**	0	0	0	2	1	0	3	**6**	SR 1304	2	APP-French Broad
LVLR	470	LITTLE BUCK CREEK		1	1	0	0	1	**3**	1	0	0	1	2	0	1	**5**	SR 1436	4.194	Grandfather
HVHR	471	CATHEYS CREEK		2	2	2	2	2	**10**	2	1	2	3	2	2	2	**14**	SR 1338	7.4	Pisgah
HVLR	472	SOUTH TOE RIVER		2	2	2	2	2	**10**	0	1	0	1	2	1	2	**7**	SR 1205	7.479	APP-Toecane
LVLR	472A	BUSICK	A	1	1	0	0	1	**3**	0	0	0	1	0	0	1	**2**	FDR 472	0.201	APP-Toecane
HVLR	472F	BLACK MTN		2	2	1	1	1	**7**	0	0	0	2	1	0	2	**5**	FDR 472	0.56	APP-Toecane
HVLR	473	PISGAH RANGER OFFICE		2	2	0	0	2	**6**	0	0	1	2	0	1	2	**6**	US 276	0.2	Pisgah
LVHR	474	ENGLISH CHAPEL DRIVE		1	2	0	0	1	**4**	0	1	2	2	1	1	1	**8**	US 276	0.2	Pisgah

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HVHR	475	DAVIDSON RIVER		2	2	2	2	2	**10**	2	2	2	3	2	2	1	**14**	US 276 FH 39	7.5	Pisgah
HVHR	475B	HEADWATER		2	2	2	2	2	**10**	2	1	2	2	2	2	3	**14**	FDR 475	7	Pisgah
HVHR	476	WOLF FORD		2	2	2	2	1	**9**	2	1	1	2	1	1	1	**9**	FDR 1206	1.8	Pisgah
HVHR	477	AVERY CREEK	S	2	2	2	2	2	**10**	2	1	2	3	1	2	2	**13**	US 276 - GATE	7.4	Pisgah
HVHR	479	BENT CREEK		2	2	2	2	2	**10**	2	1	2	3	2	2	2	**14**	SR 3480 - BENT CREEK ROAD	6.1	Pisgah
LVHR	479A	HEADQUARTERS		0	0	0	1	2	**3**	1	1	2	2	1	1	1	**9**	NC 191	0.4	Pisgah
HVHR	481	POWHATAN ACCESS		2	2	0	1	2	**7**	1	1	1	2	1	1	1	**8**	SR 1129	2.3	Pisgah
HVLR	481A	HARDTIMES LOOP		2	2	0	1	2	**7**	1	1	1	2	0	1	0	**6**	FDR 481	1.9	Pisgah
HVLR	481B	UPPER HARDTIMES LOOP		2	2	0	1	2	**7**	1	0	1	2	0	1	0	**5**	FDR 481	0.65	Pisgah
HVLR	481C	LAKESIDE LOOP		2	2	0	1	2	**7**	1	0	0	2	0	1	1	**5**	FDR 481	0.33	Pisgah
HVLR	481D	BIG JOHN LOOP		2	2	0	1	2	**7**	1	0	0	2	0	1	0	**4**	FDR 481	0.35	Pisgah
HVLR	481E	BENT CR LOOP		2	2	0	1	2	**7**	1	1	0	2	0	1	1	**6**	FDR 481	0.25	Pisgah
HVHR	481F	LAKE POWHATAN		2	1	0	1	2	**6**	1	1	1	1	0	1	3	**8**	FDR 481	0.1	Pisgah
HVLR	481G	DUMP STATION		2	2	0	1	2	**7**	1	0	0	2	1	1	1	**6**	FDR 481	0.12	Pisgah
HVHR	482	CURTIS CREEK		2	2	2	2	2	**10**	0	2	2	2	2	1	1	**10**	SR 1227	7.903	Grandfather
LVLR	482A	NEWBERRY CREEK		1	0	0	2	0	**3**	2	0	0	1	2	0	0	**5**	FDR 482	2.9	Grandfather
LVLR	484	F. B. WORK CENTER		1	2	0	0	1	**4**	0	0	2	2	0	0	3	**7**	FH 14	0.3	APP-French Broad

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HVLR	496	GINGERCAKE	S	2	2	2	2	1	**9**	0	1	0	1	2	0	2	**6**	NC 181 FH 27	7.174	Grandfather
LVLR	498	PINE ROAD		0	0	0	0	0	**0**	1	0	0	0	1	0	0	**2**	SR 1325	0.1	Tusquitee
LVLR	499	OAK ROAD		0	0	0	0	0	**0**	1	0	0	0	1	0	0	**2**	SR 1325	0.3	Tusquitee
HVHR	50	SHULER CREEK		2	1	2	2	1	**8**	0	0	2	2	2	1	2	**9**	SR 1327	3	Tusquitee
HVHR	5000	WASH CREEK	S	2	2	2	2	2	**10**	2	1	1	2	2	2	2	**12**	BLUE RIDGE PKWY	6.2	Pisgah
LVLR	5034	WOODS CEMETERY RD		0	2	0	1	0	**3**	1	0	2	0	0	0	2	**5**	SR 1324	0.2	Pisgah
HVLR	5093	PISGAH WORK CENTER		2	2	1	1	2	**8**	1	0	1	1	0	1	2	**6**	FDR 276	0.3	Pisgah
HVLR	520A	CABLE COVE R.A.		2	2	0	1	1	**6**	1	0	0	2	1	0	2	**6**	SR 1287	0.462	Cheoah
HVLR	520B	POWELL BR.		1	2	2	2	1	**8**	1	0	2	1	1	0	2	**7**	SR 1287	0.205	Cheoah
HVLR	521B	TSALI R.A.		2	2	0	0	2	**6**	1	0	0	1	1	1	1	**5**	SR 1286	0.69	Cheoah
LVLR	5500A	HUNT CAMP RD		0	0	0	1	0	**1**	0	0	0	0	1	0	1	**2**	US 19 W	0.2	APP-Toecane
LVLR	5504A	PATE CREEK WEST		0	0	0	0	0	**0**	1	0	0	0	0	0	0	**1**	FDR 5504	0.75	APP-Toecane
HVLR	5511	SEVEN MILE RIDGE		1	1	1	2	1	**6**	0	1	1	1	1	0	2	**6**	BLUE RIDGE PKWY	1.726	APP-Toecane
LVLR	5523	COLBERTS CREEK		0	0	2	1	0	**3**	1	0	0	1	1	0	0	**3**	SR 1158	2.2	APP-Toecane
LVLR	5544	BRIAR BOTTOM		2	1	0	1	1	**5**	0	0	0	2	1	0	2	**5**	FDR 472F	0.698	APP-Toecane
LVLR	5554	OGLE MEADOWS	PS	0	1	1	0	1	**3**	1	0	0	1	0	0	1	**3**	SR 197	1.901	APP-Toecane
LVHR	5570	WHITE OAK FLATS	P	0	1	1	1	0	**3**	0	0	2	2	1	1	2	**8**	SR 1415	1.84	APP-Toecane

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LVLR	5578	BOWLENS CREEK		1	1	0	0	0	**2**	2	0	0	0	1	0	1	**4**	SR 1109	0.5	APP-Toecane
LVLR	5580	POPLAR BOAT RAMP		2	1	0	0	2	**5**	1	0	0	3	0	1	2	**7**	SR 1321	0.331	APP-Toecane
LVLR	5582	IRON MTN SOUTH	P	0	0	1	0	0	**1**	1	0	0	1	1	0	2	**5**	FDR 226	0.739	APP-Toecane
LVLR	5583	EPHRAIM	P	0	0	1	0	1	**2**	1	1	0	1	2	0	2	**7**	CHER. NF 132 & NC SR 197	0.912	APP-Toecane
HVLR	56	TALLULAH RIVER		2	2	0	1	1	**6**	1	1	0	1	1	0	1	**5**	FDR 70 (GA)	1.5	Tusquitee
HVHR	57	CLIFFSIDE LAKE		2	2	1	1	2	**8**	0	1	2	2	2	2	3	**12**	FH 28-US 64	1.6	Highlands
HVLR	57A	MILLER CEMETARY	S	1	2	1	1	1	**6**	1	0	1	1	0	0	2	**5**	US 64	0.9	Highlands
HVLR	57B	CLIFFSIDE PARKING		2	2	0	1	2	**7**	1	1	0	1	0	1	1	**5**	FDR 57	0.2	Highlands
LVLR	57C	CLIFFSIDE HOST SITE	A	0	2	0	0	0	**2**	0	1	0	2	1	0	2	**6**	FDR 57	0.1	Highlands
HVLR	58	KAWANA	P	2	2	2	2	1	**9**	0	1	1	1	1	0	2	**6**	FDR 464	4.544	Grandfather
LVLR	6019	MOCCASIN CREEK		0	0	1	2	0	**3**	2	0	0	1	1	0	0	**4**	SR 1329	0.4	Tusquitee
HVLR	6020	POWERLINE COVE		1	1	2	2	1	**7**	0	0	1	1	1	0	1	**4**	SR 1329	2.9	Tusquitee
HVLR	61	WAYAH OFFICE		2	2	0	1	1	**6**	0	0	0	1	0	0	1	**2**	SR 1153	0.1	Wayah
HVLR	6148	DERREBERRY GAP		1	1	2	2	1	**7**	1	0	0	2	1	0	1	**5**	SR 1520	3	Tusquitee
LVLR	6148	SCHOOLHOUSE BR	P	0	1	2	1	0	**4**	1	0	0	0	1	0	0	**2**	SR 1505	2.6	Tusquitee
LVLR	6166A	TURNPIKE	P	0	1	2	1	0	**4**	1	1	0	0	0	0	0	**2**	FDR 6166	3	Tusquitee
LVLR	6167	SHEARER CREEK		0	0	1	2	0	**3**	1	0	0	1	0	0	2	**4**	SR 1300	1	Tusquitee
HVLR	61A	WAYAH OFFICE PARKING		2	2	0	1	1	**6**	0	0	0	1	0	0	1	**2**	FDR 61	0.02	Wayah

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HVLR	61B	WAYAH WORK CENTER		2	2	0	1	1	**6**	0	0	0	2	0	0	3	**5**	SR 1153	0.02	Wayah
HVHR	62	SLICKROCK		2	2	2	2	1	**9**	0	2	0	2	2	0	2	**8**	US 129	7.3	Cheoah
LVLR	6230	DAVE BARRET BR.	P	0	1	2	1	0	**4**	0	1	0	1	1	0	1	**4**	SR 1169	1.2	Tusquitee
HVLR	6230B	EAGLES NEST	P	2	2	1	1	0	**6**	1	0	0	0	1	0	0	**2**	FDR 6230	0.9	Tusquitee
HVLR	6236	BARNETT CREEK		2	0	2	1	1	**6**	1	1	0	1	1	0	2	**6**	US 64	1.05	Tusquitee
LVLR	6272	WHITNER BEND	PS	0	1	2	2	0	**5**	1	0	2	1	1	0	0	**5**	SR 1358	0.75	Tusquitee
LVLR	6274	WINDY RIDGE		0	0	0	1	0	**1**	2	0	0	1	1	0	1	**5**	FDR 340C	1.2	Tusquitee
HVLR	63	STONY FORK		2	1	2	2	1	**8**	0	1	0	2	1	0	3	**7**	BLUE RIDGE PKWY	4.097	APP-Toecane
HVLR	630	DRY FALLS LOOP		2	2	0	0	2	**6**	0	1	0	3	1	1	1	**7**	US 64 FH 28	0.2	Highlands
LVLR	650	HIBBERT BRANCH		0	2	1	2	0	**5**	0	0	2	0	1	0	2	**5**	SR 1310	0.6	Tusquitee
LVLR	650A	CEMETARY		0	2	0	1	0	**3**	0	0	0	1	0	0	2	**3**	FDR 650	0.1	Tusquitee
HVLR	651	PERSIMMON CR		2	1	1	2	1	**7**	0	0	2	1	1	0	1	**5**	NC 294	1	Tusquitee
LVLR	651A	LITTLE DAM		2	1	0	1	1	**5**	0	0	0	1	1	0	1	**3**	FDR 651	0.1	Tusquitee
HVHR	652A	LOOP A		2	2	0	1	2	**7**	0	0	0	3	1	1	3	**8**	SR	0.2	Tusquitee
HVLR	652B	LOOP B		2	2	0	1	2	**7**	0	0	0	2	1	1	1	**5**	SR	0.2	Tusquitee
HVLR	652C	LOOP C		2	2	0	1	2	**7**	0	0	0	3	1	1	1	**6**	SR 6520	0.35	Tusquitee
HVLR	652D	LOOP D		2	2	0	1	2	**7**	0	0	0	3	1	1	0	**5**	SR	0.65	Tusquitee
HVHR	652E	OLD BOAT RAMP		2	2	0	1	2	**7**	0	0	0	3	1	1	3	**8**	SR	0.1	Tusquitee

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HVLR	652F	RAMSEY BLUFF		2	1	2	2	1	8	0	0	0	2	1	0	1	4	SR.	1.3	Tusquitee
HVLR	653	OLD MURPHY HWY		2	1	1	2	1	7	1	1	2	1	1	0	1	7	US 19	1	Tusquitee
HVLR	653A	KILLIAN BR		1	2	1	1	1	6	1	0	0	2	1	0	0	4	FDR 6530	0.5	Tusquitee
LVLR	653B	LAKESIDE		1	2	1	0	1	5	1	0	1	2	0	0	1	5	FDR 6540	0.2	Tusquitee
HVLR	654	HIAWASSEE CHURCH	P	0	2	2	2	0	6	1	0	0	0	1	0	0	2	SR 1326	0.2	Tusquitee
HVHR	67	UPPER NANTAHALA		2	2	2	3	2	11	0	1	2	2	2	1	3	11	OLD US 64	11.8	Wayah
HVLR	67B	LONG BRANCH		2	2	1	0	1	6	1	0	0	2	1	0	1	5	FDR 67	0.2	Wayah
HVHR	69	WAYAH BALD		2	2	2	3	2	11	0	1	1	2	1	1	3	9	SR 1310	4.6	Wayah
HVLR	69B	WINE SPRING BALD		1	2	1	3	1	8	0	0	1	2	0	0	2	5	FDR 69	0.9	Wayah
HVHR	70	COWEE BALD	P	1	2	2	3	1	9	0	1	2	2	1	0	2	8	SR 1341	7.5	Wayah
LVLR	7000	GREASY BR DOCK	PS	1	1	0	0	1	3	0	0	1	1	0	1	0	3	SR 1313	0.1	Wayah
HVLR	7002	FLAT BR ACCESS		2	2	0	0	2	6	0	0	0	1	0	1	0	2	SR 1313	0.5	Wayah
LVLR	7018	SWAIN COUNTY LANDFILL	S	0	1	0	0	1	2	1	0	0	1	0	0	0	2	SR 1311	0.2	Wayah
HVLR	7019	SHUT IN GAP	P	1	2	2	3	1	9	2	0	0	1	1	0	1	5	SR 1388	5.38	Wayah
LVLR	7052	YOUNCE CREEK	P	0	0	0	0	0	0	1	0	0	1	1	0	2	5	SR 1390	0.31	Wayah
LVLR	7060	MOUSE MT	P	0	2	1	2	0	5	0	0	0	0	1	0	0	1	SR 1357	0.5	Wayah
LVLR	7061	GUNTER GAP	P	1	1	1	0	1	4	1	0	0	2	1	0	2	6	FDR 86	0.9	Wayah
LVLR	7069	SILES BRANCH		1	1	1	1	1	5	0	1	0	1	1	0	2	5	SR 28	1	Wayah
LVLR	7070	BEASLEY CREEK	P	1	1	1	0	1	4	1	0	0	0	1	0	0	2	SR 1347	0.3	Wayah

FINAL RATING CATEGORY	Road Number	Name	Private Access/Major SU/Administrative Site*	Recreation Value	Social Value	Timber Management Value	Fire Management Value	Traffic Volume	TOTAL VALUE	Suppression Risk	Biological Diversity Risk	Heritage Resources Risk	Public Safety Risk	Aquatic Biota Vulnerability	Wildlife Risk	Maintenance Cost Risk	TOTAL RISK	BEGIN_TERMINI	Length	District
LVLR	7071	FED COVE	P	0	0	0	1	0	**1**	1	0	0	1	1	0	1	**4**	SR 1342	0.31	Wayah
LVLR	7072	BROWN CREEK	P	0	1	0	1	1	**3**	1	0	0	2	1	0	2	**6**	SR 1500	0.6	Wayah
LVLR	7073	BIRD FALLS	P	1	2	0	1	1	**5**	1	0	1	2	1	0	0	**5**	US 19	0.53	Wayah
LVLR	7099	CHESTNUT ORCHARD BR		0	0	0	0	0	**0**	1	0	2	1	1	0	2	**7**	FDR 440	0.3	Wayah
HVHR	71	DEEP GAP		2	1	2	1	1	**7**	1	1	2	2	1	1	3	**11**	US 64	5.9	Wayah
HVLR	711	WINESPRGS WHITEOAK	S	2	2	2	1	1	**8**	0	1	1	3	1	0	1	**7**	SR 1310	15.1	Wayah
HVLR	711B	DIRTY JOHN SHOOTING RG		2	2	0	3	1	**8**	0	0	1	2	0	0	3	**6**	FDR 711	0.319	Wayah
LVLR	711G	WINE SPRINGS HORSE CAMP		2	2	0	0	1	**5**	1	0	0	2	1	0	2	**6**	FDR 711	0.4	Wayah
HVLR	713	SHINGLETREE BRANCH		2	2	2	3	1	**10**	0	1	1	1	1	0	2	**6**	SR 1310	4	Wayah
LVLR	7197	ONION MTN	P	0	0	0	1	0	**1**	1	0	0	1	0	0	2	**4**	SR 1521	0.5	Wayah
LVHR	7202	PUMPKINTOWN	PS	0	0	2	1	0	**3**	1	0	1	1	2	1	3	**9**	SR 1300	0.7	Wayah
LVLR	7280	JARRETT CREEK		1	1	2	0	1	**5**	1	1	1	1	0	0	2	**6**	SR 1310	0.1	Wayah
LVLR	7280Z	WAYAH CREST		2	2	0	0	1	**5**	0	0	0	2	0	0	2	**4**	FDR 7280	0.05	Wayah
HVLR	7285	FEREBEE MEMORIAL		2	2	0	1	2	**7**	0	0	1	2	1	0	1	**5**	US 19 AND US 74	0.074	Wayah
HVLR	7286	NANTAHALA LAUNCH		2	2	0	1	2	**7**	0	0	0	2	1	0	2	**5**	SR 1310	0.2	Wayah
LVLR	7290	ANDY GAP	P	0	1	1	2	0	**4**	1	0	0	1	1	0	1	**4**	SR 1107	0.25	Wayah
LVLR	7302	BREEDLOVE	P	0	0	0	0	0	**0**	1	0	0	0	0	0	0	**1**	SR 1110	0.2	Wayah
LVLR	7303	CHARLEY BR	P	0	0	1	0	0	**1**	1	0	0	0	1	0	0	**2**	PVT RD	0.2	Wayah
HVHR	74	BIG IVY		2	2	2	1	2	**9**	0	2	0	3	2	1	3	**11**	SR 2173	8.691	APP-Toecane

FINAL RATING CATEGORY	Road Number	Name	Private Access/Major SU/Administrative Site*	Recreation Value	Social Value	Timber Management Value	Fire Management Value	Traffic Volume	TOTAL VALUE	Suppression Risk	Biological Diversity Risk	Heritage Resources Risk	Public Safety Risk	Aquatic Biota Vulnerability	Wildlife Risk	Maintenance Cost Risk	TOTAL RISK	BEGIN_TERMINI	Length	District
HVHR	75	SNOWBIRD		2	2	2	2	1	**9**	0	1	2	2	2	0	2	**9**	SR 1120	4.1	Cheoah
HVLR	751	SHOPE FORK		2	2	1	3	1	**9**	0	0	0	1	2	0	2	**5**	FDR 83	3.883	Wayah
HVLR	753	HEADQUARTERS SYSTEM		2	2	0	2	1	**7**	0	0	2	1	1	0	1	**5**	FDR 751	0.3	Wayah
HVLR	763	JONES CREEK		2	2	1	1	1	**7**	2	0	0	1	1	0	3	**7**	SR 1130	1.274	Wayah
LVLR	77	BROWN GAP	P	1	1	1	1	1	**5**	1	0	1	1	1	0	0	**4**	FDR 79	0.9	Highlands
HVHR	787	SLIDING ROCK		2	2	0	0	2	**6**	0	1	0	3	1	1	3	**9**	US 276	0.1	Pisgah
HVHR	79	BLUE VALLEY		2	2	1	2	2	**9**	2	1	1	3	2	1	1	**11**	SR 1618	5.2	Highlands
HVLR	79C	EAST PRONG OVERFLOW		2	2	0	1	1	**6**	1	0	0	1	2	0	2	**6**	FDR 79	0.6	Highlands
HVLR	80	COPPER CR.	P	1	2	2	2	0	**7**	1	0	0	1	1	0	1	**4**	SR 1333	2.5	Tusquitee
HVHR	803	DAVIDSON RIVER C.G.		2	2	0	0	2	**6**	0	1	2	3	1	1	0	**8**	US 276 FH 38	3.3	Pisgah
HVLR	803A	SYCAMORE LOOP		2	2	0	0	2	**6**	0	1	1	2	0	1	1	**6**	FDR 803	0.14	Pisgah
HVLR	803B	WHITE OAK LOOP		2	2	0	0	2	**6**	0	1	1	2	0	1	1	**6**	FDR 803	0.35	Pisgah
HVLR	803C	APPLE TREE LOOP		2	2	0	0	2	**6**	0	1	1	2	1	1	1	**7**	FDR 803	0.3	Pisgah
HVLR	803D	DOGWOOD LOOP		2	2	0	0	2	**6**	0	1	1	2	1	1	1	**7**	FDR 803	0.25	Pisgah
HVLR	803DS	DUMP STA		2	2	0	0	2	**6**	0	1	1	2	0	1	1	**6**	FDR 803	0.05	Pisgah
HVHR	803E	LAUREL LOOP		2	2	0	0	2	**6**	0	1	1	2	1	1	2	**8**	FDR 803	0.3	Pisgah
HVLR	803F	POPLAR LOOP		2	2	0	0	2	**6**	0	1	1	2	0	1	1	**6**	FDR 803	0.25	Pisgah
HVLR	803G	HEMLOCK LOOP		2	2	0	0	2	**6**	0	1	1	2	0	1	0	**5**	FDR 803	0.25	Pisgah
HVLR	805	ROCKY BLUFF R.A.		2	2	1	1	1	**7**	0	0	1	2	0	0	2	**5**	NC 209	0.7	APP-French Broad

FINAL RATING CATEGORY	Road Number	Name	Private Access/Major SU/Administrative Site*	Recreation Value	Social Value	Timber Management Value	Fire Management Value	Traffic Volume	TOTAL VALUE	Suppression Risk	Biological Diversity Risk	Heritage Resources Risk	Public Safety Risk	Aquatic Biota Vulnerability	Wildlife Risk	Maintenance Cost Risk	TOTAL RISK	BEGIN_TERMINI	Length	District
LVLR	805A	ROCKY BLUFF EXT.		1	1	0	0	1	**3**	0	0	1	2	0	0	3	**6**	FDR 805	0.1	APP-French Broad
HVHR	81	UPPER SANTEETLAH		2	2	2	2	2	**10**	0	1	2	2	2	1	2	**10**	SR 1127	10.63	Cheoah
HVHR	812	CRADLE OF FORESTRY		2	2	0	1	2	**7**	0	2	2	2	0	2	1	**9**	US 276	0.3	Pisgah
HVHR	816	BLACK BALSAM		2	2	0	2	2	**8**	2	2	2	3	0	2	3	**14**	BLUE RIDGE PKWY	1.3	Pisgah
HVLR	81C	WHIGG BRANCH		1	1	2	1	1	**6**	0	1	1	1	1	0	2	**6**	FDR 81	1.7	Cheoah
HVHR	81F	WOLF LAUREL		2	2	2	2	1	**9**	0	1	2	2	2	0	2	**9**	FDR 81	4.66	Cheoah
LVLR	81G	SWAN MEADOWS		0	0	1	1	0	**2**	0	0	1	1	1	0	2	**5**	FDR 81	1	Cheoah
LVLR	81I	SWAN CABIN		1	1	0	1	1	**4**	0	0	0	2	1	0	2	**5**	FDR 81F	0.4	Cheoah
LVLR	81J	STEWART CABIN		2	2	0	0	1	**5**	0	0	2	1	1	0	0	**4**	FDR 81	0.1	Cheoah
HVLR	83	BALL CREEK		2	2	2	3	1	**10**	0	1	0	1	2	0	2	**6**	SR 1110	6.937	Wayah
LVLR	83D	DYKE GAP		0	0	1	1	0	**2**	0	0	0	0	2	0	3	**5**	FDR 83	2.5	Wayah
HVLR	84	MICKENS BRANCH		2	1	1	2	1	**7**	0	0	0	2	0	0	2	**4**	SR 1314	1.5	Tusquitee
HVLR	85	PANTHER TOP		2	1	2	2	1	**8**	0	0	2	0	1	0	1	**4**	SR 1303	2.5	Tusquitee
HVHR	85A	PANTHER GAP		2	1	2	2	1	**8**	1	1	2	1	1	0	2	**8**	FDR 85	4.56	Tusquitee
LVLR	85A1	LIGHTNING RIDGE		1	1	1	2	0	**5**	1	0	2	0	1	0	3	**7**	FDR 85A	0.7	Tusquitee
HVHR	86	CONNELLY CR		2	2	2	1	1	**8**	1	0	2	2	2	0	3	**10**	SR 1177	3.73	Wayah
LVLR	90	LBJ	A	1	2	0	0	2	**5**	1	0	1	1	1	1	1	**6**	SR 1310	0.3	Wayah
LVLR	95	ARROWOOD GLADE		1	1	0	0	1	**3**	0	0	1	2	1	0	3	**7**	SR 1310-FH 35	0.136	Wayah

FINAL RATING CATEGORY	Road Number	Name	Private Access/Major SU/Administrative Site*	Recreation Value	Social Value	Timber Management Value	Fire Management Value	Traffic Volume	TOTAL VALUE	Suppression Risk	Biological Diversity Risk	Heritage Resources Risk	Public Safety Risk	Aquatic Biota Vulnerability	Wildlife Risk	Maintenance Cost Risk	TOTAL RISK	BEGIN_TERMINI	Length	District
LVLR	954	FOX CAMP		1	1	1	1	1	**5**	1	0	0	1	1	0	2	**5**	NC 181 FH 27	0.306	Grandfather
HVHR	981	ROSEBORO-EDGEMONT		2	2	2	2	1	**9**	1	1	1	2	1	0	2	**8**	SR 1511	4.466	Grandfather
HVLR	982	MORTIMER PIEDMONT		1	1	2	2	1	**7**	0	1	0	1	1	0	2	**5**	SR 1328	7.5	Grandfather
LVLR	985	LOWER UPPER CR		1	1	1	0	1	**4**	1	0	0	1	1	0	2	**5**	NC 181	0.583	Grandfather
HVLR	99	TABLE ROCK		2	2	1	1	1	**7**	2	2	1	2	0	0	0	**7**	FS BOUNDRY	2.866	Grandfather

* This column is not all-inclusive. It may serve as an indicator of why a road is open in some cases where the road is of limited usefulness for resource management. P = private access; S = major special use; A = administrative site.

Appendix B - Open Roads Not Meeting LRMP Standards for Minimum Maintenance Level

Approximately 40 miles of road do not meet the minimum maintenance level.

Number	Name	Miles	District	ObML	OpML	TSL
81J	STEWART CABIN	0.10	Cheoah	3	2	C
148H	HORSE CAMP	0.05	French Broad	3	2	C
3505A	CATPEN EXT	1.30	French Broad	3	2	C
3548A	GLADDEN RIDGE	0.47	French Broad	3	2	C
3571-1	HAYWOOD HURRICANE EXT	1.10	French Broad	3	2	C
4008	GOOD CEM	0.82	Grandfather	3	2	C
954	FOX CAMP	0.31	Grandfather	3	2	C
985	LOWER UPPER CR	0.58	Grandfather	3	2	C
4522	JONES GAP	2.00	Highlands	3	2	C
4525	BUCKEYE CREEK	0.70	Highlands	3	2	C
4543	RATTLESNAKE ROAD	0.20	Highlands	3	2	C
4549	SHORTOFF	1.00	Highlands	3	2	C
4625	GREEN COVE	0.50	Highlands	3	2	C
4652	OLD BALD RIDGE	7.00	Highlands	3	2	C
4672	LAUREL FALLS	1.00	Highlands	3	2	C
4674A	HOGBACK SPUR A	0.20	Highlands	3	2	C
229	PILOT MTN.	2.70	Pisgah	3	2	C
5034	WOODS CEMETERY RD	0.20	Pisgah	3	2	C
5582	IRON MTN SOUTH	0.74	Toecane	3	2	C
139A	OGREETA SPUR	0.10	Tusquitee	3	2	C
333A2	BURCH	0.70	Tusquitee	3	2	C
420-1	TRAIL 1	6.00	Tusquitee	4	2	B
427A	BRUSHY RIDGE	1.10	Tusquitee	3	2	C
6167	SHEARER CREEK	1.00	Tusquitee	3	2	C
6274	WINDY RIDGE	1.20	Tusquitee	3	2	C
650	HIBBERT BRANCH	0.60	Tusquitee	3	2	C
651A	LITTLE DAM	0.10	Tusquitee	4	2	B
7000	GREASY BR DOCK	0.10	Wayah	5	2	C
7019	SHUT IN GAP	4.28	Wayah	3	2	C
7060	MOUSE MT	0.50	Wayah	3	2	C
7069	SILES BRANCH	1.00	Wayah	4	2	B
7070	BEASLEY CREEK	0.30	Wayah	4	2	B
7071	FED COVE	0.31	Wayah	3	2	C
7099	CHESTNUT ORCHARD BR	0.30	Wayah	3	2	C
7302	BREEDLOVE	0.20	Wayah	4	2	B
7303	CHARLEY BR	0.20	Wayah	4	2	B

ObML - Objective Maintenance Level
OpML - Operational Maintenance Level
TSL – Traffic Service Level

Appendix C – Watershed Condition, Watershed Vulnerability, and Aquatic Biota Vulnerability Information by 6th level HUC

Watershed Condition and Watershed Vulnerability

(For Location of 6th level HUCs, see "MAPS")

HUCODE	River Basin	Acres	Proportion NFL	Stream density mi/mi2	Road density mi/mi2	2000 Population density/mi2	% Pop density Change 90-00	Stream Crossings	Non Point Source	Proportion Riparian	Weighted Eros Hazard	Proportion lakes	Aquatic PETS	Proportion Impaired	Proportion ORW or NSW	Municipal Supply	Endemic Fish	Overall Condition	AR Overall Condition	Overall Vulnerability	AR Overall Vulnerability	RAP watershed condition	RAP watershed vulnerability
03040101010010	Yakin	27160	0.037	3.716	0.121	161.840	9.866	135	0.126	0.055	1.223	0.0000	0	0.000	0.000	0	0.0000	488.5	70	825.5	143	M	H
03050101010010	Catawba	23924	0.514	3.096	1.534	95.489	18.133	280	0.085	0.071	1.404	0.0000	3	0.000	0.000	3	0.0196	432	53	708	134	M	H
03050101010020	Catawba	10936	0.924	2.694	3.983	95.234	18.126	130	0.023	0.073	1.604	0.0000	3	0.000	0.000	0	0.0196	579	98	728	137	M	H
03050101010030	Catawba	24196	0.334	2.976	2.089	95.364	18.133	146	0.238	0.045	1.241	0.0000	3	0.008	0.000	4	0.0196	398	36	614	95	M	M
03050101010050	Catawba	16966	0.628	2.680	3.158	95.344	18.132	239	0.045	0.085	1.546	0.0109	3	0.000	0.000	0	0.0196	539.5	84	679.5	129	M	H
03050101010060	Catawba	17297	0.247	2.790	5.313	95.364	18.133	125	0.279	0.031	1.236	0.0068	3	0.000	0.000	3	0.0196	295	13	597.5	82	P	M
03050101020010	Catawba	28558	0.352	2.435	2.817	95.154	18.095	220	0.093	0.040	1.625	0.0000	3	0.000	0.000	2	0.0000	439.5	56	608.5	90.5	M	M
03050101020020	Catawba	20658	0.451	3.202	1.123	95.358	18.132	251	0.076	0.056	1.654	0.0000	3	0.000	0.000	1	0.0000	530	80	638.5	107	M	H
03050101020030	Catawba	5479	0.462	3.301	18.774	95.364	18.133	31	0.072	0.060	1.126	0.0043	3	0.000	0.000	1	0.0000	542	85.5	679	128	M	H
03050101030010	Catawba	28352	0.003	3.304	1.693	82.494	16.044	248	0.251	0.021	1.877	0.0047	3	0.000	0.000	0	0.1400	312	16	436.5	10	P	L
03050101030020	Catawba	14619	0.858	2.096	6.744	175.775	17.703	42	0.009	0.054	1.567	0.0000	3	0.000	0.000	0	0.1400	588	101.5	589	78	M	M
03050101030030	Catawba	21857	0.246	2.010	4.428	152.044	17.782	72	0.054	0.047	1.332	0.0480	3	0.000	0.000	0	0.1400	575	95	550.5	51.5	M	M
03050101060010	Catawba	23707	0.839	1.569	0.596	175.790	17.699	126	0.018	0.041	1.527	0.0000	4	0.000	0.572	0	0.1373	626.5	112	469.5	16	G	M
03050101060020	Catawba	9997	0.005	2.219	6.218	175.834	17.703	2	0.304	0.007	1.072	0.0000	4	0.000	0.000	2	0.1373	449.5	59	500.5	29	M	M
03050101060030	Catawba	22012	0.381	2.000	8.620	175.834	17.703	116	0.061	0.047	1.543	0.0012	4	0.000	0.000	0	0.1373	421	47	503.5	30	M	M
03050101070010	Catawba	47389	0.656	2.688	1.905	158.081	9.872	525	0.065	0.041	1.600	0.0000	3	0.000	0.000	0	0.1429	464.5	62	494.5	26	M	M
03050101070020	Catawba	26571	0.470	3.021	6.511	164.015	9.484	276	0.052	0.034	1.448	0.0000	3	0.000	0.000	0	0.1429	504.5	75	599	83	M	M
03050101070030	Catawba	44189	0.892	2.307	0.853	103.568	12.017	416	0.010	0.067	1.529	0.0000	3	0.000	0.804	0	0.1429	533.5	82	544.5	47	M	M
03050101070040	Catawba	17205	0.209	2.586	4.844	175.601	17.540	52	0.085	0.024	1.106	0.0000	3	0.000	0.000	0	0.1429	558.5	92	620	99.5	M	M
03060101010010	Savannah	24845	0.012	3.866	3.162	77.586	14.956	241	0.150	0.070	1.364	0.0316	5	0.000	0.000	0	0.2581	424	49.5	489.5	24	M	M
03060101010020	Savannah	21157	0.086	3.279	3.140	71.836	19.320	214	0.087	0.093	1.633	0.0129	5	0.000	0.000	0	0.2581	343	21	446.5	13.5	P	M
03060101020010	Savannah	16148	0.525	2.137	7.758	73.318	18.098	127	0.017	0.073	1.711	0.0000	5	0.000	0.000	0	0.2188	474	68	497.5	27	M	M
03060102010010	Savannah	21652	0.580	2.703	5.023	66.113	23.828	285	0.064	0.054	1.625	0.0027	5	0.051	0.222	0	0.2000	339	19.5	288	2	P	L
03060102010020	Savannah	16184	0.740	3.370	0.798	57.774	26.833	386	0.116	0.035	1.642	0.0011	5	0.000	0.256	0	0.2000	403.5	37	339	3	M	L
03060102010030	Savannah	1865	0.975	2.177	13.771	67.455	23.423	15	0.000	0.082	1.909	0.0000	5	0.000	0.000	0	0.2000	620.5	109	499	28	G	M
03060102070010	Savannah	6753	0.978	4.332	21.063	40.939	22.683	141	0.000	0.070	1.960	0.0000	5	0.000	0.000	0	0.2000	622.5	111	483	21.5	G	M
06010103020010	Watauga	33231	0.042	0.287	0.175	70.143	15.472	36	0.203	0.000	1.706	0.0009	4	0.000	0.000	2	0.1176	480.5	69	345.5	4	M	L
06010103100010	Watauga	564	0.321	1.123	#####	69.502	15.471	6	0.419	0.000	1.558	0.0000	1	0.000	0.000	0	0.2308	531.5	81	537	43	M	M
06010105010010	Fr Broad	24223	0.930	2.805	3.541	77.594	14.952	340	0.085	0.071	1.708	0.0000	1	0.000	0.000	0	0.0769	535.5	83	646	113	M	H

HUCODE	River Basin	Acres	Proportion NFL	Stream density mi/mi2	Road density mi/mi2	2000 Population density/mi2	% Pop density Change 90-00	Stream Crossings	Non Point Source	Proportion Riparian	Weighted Eros Hazard	Proportion lakes	Aquatic PETS	Proportion Impaired	Proportion ORW or NSW	Municipal Supply	Endemic Fish	Overall Condition	AR Overall Condition	Overall Vulnerability	AR Overall Vulnerability	RAP watershed condition	RAP watershed vulnerability
06010105010020	Fr Broad	19040	0.551	3.719	1.525	77.564	14.971	306	0.174	0.028	1.488	0.0027	1	0.005	0.000	0	0.0769	473.5	67	507.5	32	M	M
06010105010030	Fr Broad	6190	0.031	4.213	13.183	77.604	14.946	137	0.331	0.031	1.065	0.0000	1	0.000	0.000	0	0.0769	422.5	48	698	133	M	H
06010105010050	Fr Broad	41029	0.095	3.474	1.321	77.603	14.945	248	0.474	0.026	1.095	0.0064	1	0.005	0.000	0	0.0769	355.5	25	549.5	48.5	P	M
06010105010060	Fr Broad	9574	0.770	2.533	16.081	77.603	14.945	172	0.172	0.066	1.637	0.0025	1	0.000	0.000	2	0.0769	520	79	527	40.5	M	M
06010105010070	Fr Broad	30506	0.900	2.499	1.248	77.610	14.945	368	0.055	0.063	1.504	0.0033	1	0.000	0.000	0	0.0769	514	78	622.5	102	M	M
06010105020015	Fr Broad	10025	0.060	3.199	9.752	179.814	25.633	139	0.453	0.024	1.423	0.0034	3	0.000	0.000	0	0.0000	237	4	649.5	117	P	H
06010105020020	Fr Broad	21226	0.610	3.221	5.216	235.147	27.715	379	0.218	0.066	1.345	0.0000	3	0.114	0.000	3	0.0000	198.5	3	643	110	P	H
06010105020030	Fr Broad	26831	0.863	3.286	4.555	137.680	22.969	410	0.045	0.095	1.630	0.0017	3	0.000	0.571	1	0.0000	412	41	562.5	57	M	M
06010105050010	Fr Broad	40456	0.195	3.384	2.730	304.359	19.267	315	0.391	0.038	0.980	0.0085	4	0.000	0.000	0	0.0000	192	2	656	121	P	H
06010105060020	Fr Broad	24575	0.226	2.902	1.677	313.862	18.335	363	0.282	0.032	1.422	0.0000	4	0.172	0.000	0	0.0566	344.5	22	527	40.5	P	M
06010105060030	Fr Broad	16277	0.086	3.461	0.473	314.527	18.338	165	0.598	0.013	0.910	0.0056	4	0.225	0.000	0	0.0566	298	14	471.5	17	P	M
06010105070010	Fr Broad	20240	0.001	2.412	0.421	313.982	18.337	0	0.091	0.052	1.681	0.0209	4	0.000	0.000	2	0.0556	550	88.5	412	6	M	L
06010105070020	Fr Broad	14184	0.001	3.620	1.258	313.866	18.337	66	0.361	0.024	1.334	0.0014	4	0.000	0.000	5	0.0556	370.5	31	474	18	P	M
06010105070030	Fr Broad	25217	0.050	2.382	0.713	314.527	18.338	17	0.245	0.018	1.516	0.0064	4	0.000	0.000	0	0.0556	384.5	33	482.5	20	P	M
06010105080020	Fr Broad	25732	0.015	2.929	0.677	314.528	18.338	41	0.308	0.024	1.481	0.0167	3	0.000	0.000	6	0.0566	362.5	27	446.5	13.5	P	M
06010105100030	Fr Broad	10024	0.051	3.571	3.151	43.731	15.820	67	0.350	0.057	0.955	0.0032	3	0.000	0.000	0	0.0784	542	85.5	650	118	M	H
06010105100040	Fr Broad	15674	0.120	2.274	4.803	43.731	15.820	116	0.145	0.044	1.388	0.0034	3	0.000	0.000	0	0.0784	640	115	590	79	G	M
06010105110010	Fr Broad	38869	0.361	2.018	1.342	314.027	18.337	216	0.169	0.029	1.613	0.0000	11	0.000	0.000	0	0.0455	472.5	66	432	9	M	L
06010105120010	Fr Broad	22352	0.022	2.874	2.834	44.167	15.847	284	0.130	0.053	1.688	0.0000	8	0.000	0.000	0	0.0508	591	104	517	37	M	M
06010105120020	Fr Broad	14579	0.353	4.549	3.323	43.773	15.817	426	0.095	0.117	1.642	0.0000	8	0.000	0.000	0	0.0508	593.5	106	581	70.5	M	M
06010105120030	Fr Broad	11468	0.645	4.027	1.659	43.730	15.820	158	0.054	0.072	0.970	0.0118	8	0.000	0.000	0	0.0508	665.5	118	580.5	69	G	M
06010105120040	Fr Broad	3614	0.942	5.226	16.247	43.730	15.815	58	0.025	0.172	0.710	0.0164	16	0.000	0.000	2	0.0508	686.5	121	550	50	G	M
06010105130010	Fr Broad	22247	0.088	3.797	1.748	43.745	15.819	452	0.188	0.080	1.969	0.0000	16	0.000	0.000	2	0.0959	442	57	420	7	M	L
06010105130020	Fr Broad	21026	0.042	4.935	4.751	43.730	15.820	314	0.135	0.114	1.548	0.0000	16	0.000	0.000	0	0.0959	498.5	73	555.5	54	M	M
06010105130030	Fr Broad	35338	0.553	5.294	0.988	43.731	15.820	769	0.121	0.119	0.875	0.0000	16	0.000	0.000	0	0.0959	583.5	99	650.5	119	M	H
06010105130040	Fr Broad	6206	0.782	5.705	10.923	43.731	15.820	216	0.027	0.203	0.713	0.0000	16	0.000	0.000	0	0.0959	590	103	666.5	125	M	H
06010105140010	Fr Broad	15992	0.543	5.271	8.315	43.730	15.820	338	0.136	0.116	0.776	0.0000	16	0.000	0.000	1	0.0959	493.5	71	586	75.5	M	M
06010106010010	Fr Broad	33897	0.436	3.229	4.744	97.546	15.093	524	0.177	0.064	1.767	0.0006	4	0.000	0.000	0	0.0727	357.5	26	525	39	P	M
06010106010020	Fr Broad	41314	0.622	2.834	2.864	97.500	15.094	526	0.127	0.051	1.690	0.0030	4	0.000	0.000	0	0.0727	346.5	23	490	25	P	M
06010106020040	Fr Broad	22685	0.064	2.914	1.346	97.528	15.094	382	0.233	0.023	1.559	0.0035	3	0.000	0.000	0	0.1961	438	55	468.5	15	M	M
06010106020050	Fr Broad	5623	0.086	3.676	1.553	97.533	15.091	110	0.099	0.078	1.414	0.0261	3	0.000	0.000	0	0.1961	651	116	578.5	67	G	M
06010106020060	Fr Broad	39121	0.026	3.008	3.351	97.472	15.091	3	0.007	0.077	1.436	0.0000	3	0.000	0.572	0	0.1961	715.5	127	584.5	73.5	G	M
06010106020070	Fr Broad	51724	0.492	3.910	0.174	97.411	15.091	504	0.029	0.119	1.485	0.0001	3	0.000	0.000	2	0.1961	621	110	564	58	G	M
06010106030010	Fr Broad	22773	0.003	3.573	0.480	97.506	15.096	27	0.241	0.050	1.544	0.0000	1	0.000	0.000	2	0.0851	505	76	569.5	61.5	M	M
06010106030020	Fr Broad	20869	0.000	3.072	3.510	97.532	15.091	29	0.577	0.013	1.092	0.0097	1	0.047	0.000	0	0.0851	420.5	46	512.5	36	M	M
06010108010010	Fr Broad	29482	0.112	3.168	1.772	69.503	15.464	312	0.245	0.031	1.857	0.0000	2	0.000	0.000	0	0.0652	334	18	577	65	P	M

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06010108010020	Fr Broad	37685	0.000	2.972	0.543	69.758	14.279	240	0.219	0.021	1.547	0.0000	2	0.000	0.000	0	0.0652	418.5	43	603	85	M	M
06010108010040	Fr Broad	15735	0.073	3.009	6.160	66.280	10.603	78	0.237	0.033	1.524	0.0010	2	0.000	0.000	0	0.0652	408.5	39	588.5	77	M	M
06010108020010	Fr Broad	27815	0.708	2.701	0.614	57.044	15.282	296	0.066	0.052	1.694	0.0000	1	0.000	0.732	1	0.0465	577	96	504.5	31	M	M
06010108020020	Fr Broad	14618	0.087	3.133	1.495	56.968	15.274	33	0.290	0.023	1.363	0.0000	1	0.000	0.500	0	0.0465	466	63	611	92.5	M	M
06010108020030	Fr Broad	13908	0.013	3.186	5.215	56.968	15.274	168	0.332	0.025	1.366	0.0000	1	0.000	0.000	0	0.0465	367.5	29	687.5	132	P	H
06010108060010	Fr Broad	29462	0.199	3.343	1.375	70.973	8.692	459	0.252	0.038	1.505	0.0000	3	0.000	0.000	0	0.0385	467.5	64	683	130	M	H
06010108060020	Fr Broad	14742	0.162	2.675	5.984	70.982	8.689	156	0.215	0.017	1.545	0.0000	3	0.000	0.000	0	0.0385	513	77	636	105	M	H
06010108070010	Fr Broad	41553	0.113	2.788	0.792	57.040	15.278	425	0.199	0.035	1.694	0.0000	4	0.000	0.000	4	0.0377	414.5	42	510	35	M	M
06010108080030	Fr Broad	10164	0.135	3.803	4.646	56.946	15.275	251	0.211	0.069	1.930	0.0000	4	0.000	0.000	0	0.0566	572	94	571	63	M	M
06010108080040	Fr Broad	14465	0.286	5.183	5.173	56.968	15.273	433	0.085	0.140	1.570	0.0000	4	0.000	0.000	0	0.0566	552	90.5	647	114	M	H
06010108100010	Fr Broad	24343	0.436	5.891	0.729	70.969	8.692	676	0.055	0.184	1.547	0.0000	5	0.000	0.000	0	0.0741	638	113	617	98	G	M
06010108100020	Fr Broad	6281	0.797	5.570	1.184	57.037	15.230	99	0.000	0.206	1.257	0.0000	5	0.000	0.000	0	0.0741	783.5	141	686	131	G	H
06010108120010	Fr Broad	1460	1.000	5.026	68.702	56.970	15.276	28	0.000	0.190	1.643	0.0000	8	0.000	0.000	0	0.0678	692.5	125	579.5	68	G	M
06010202020010	Little Tenn	21656	0.474	2.580	5.956	57.773	26.834	286	0.177	0.019	1.485	0.0014	4	0.000	0.000	0	0.0784	286	10	488.5	23	P	M
06010202020020	Little Tenn	36898	0.368	2.274	3.690	57.773	26.834	254	0.244	0.014	1.352	0.0005	4	0.000	0.000	0	0.0784	260.5	6.5	533.5	42	P	M
06010202020030	Little Tenn	37864	0.445	2.347	4.650	57.773	26.834	262	0.212	0.032	1.436	0.0000	4	0.000	0.000	2	0.0784	239	5	508.5	34	P	M
06010202030010	Little Tenn	21956	0.543	3.337	5.429	57.805	26.821	583	0.215	0.030	1.689	0.0014	5	0.063	0.000	4	0.1400	190	1	246.5	1	P	L
06010202030020	Little Tenn	24719	0.347	2.050	2.264	57.781	26.830	247	0.178	0.028	1.535	0.0000	5	0.000	0.000	0	0.1400	369	30	483	21.5	P	M
06010202030030	Little Tenn	13180	0.171	1.824	3.212	57.783	26.830	137	0.125	0.025	1.734	0.0000	5	0.000	0.000	0	0.1400	393	35	437	11	P	L
06010202040010	Little Tenn	15832	0.063	2.333	4.555	57.776	26.833	110	0.397	0.007	1.093	0.0066	4	0.000	0.000	0	0.0870	279.5	9	508	33	P	M
06010202040020	Little Tenn	25441	0.412	2.474	2.938	57.773	26.834	207	0.272	0.030	1.285	0.0022	4	0.000	0.000	0	0.0870	260.5	6.5	542	45	P	M
06010202040030	Little Tenn	24219	0.272	3.587	1.114	57.753	26.829	286	0.171	0.051	1.449	0.0000	4	0.000	0.000	0	0.0870	354.5	24	595.5	81	P	M
06010202040040	Little Tenn	15335	0.382	2.923	15.252	57.773	26.834	120	0.083	0.058	1.402	0.0000	4	0.000	0.000	2	0.0870	409	40	555	53	M	M
06010202050010	Little Tenn	58092	0.840	3.115	1.875	53.648	26.035	609	0.007	0.070	1.848	0.0216	5	0.000	0.330	0	0.0417	499	74	423	8	M	L
06010202050020	Little Tenn	28335	0.604	3.382	1.376	57.258	26.683	398	0.013	0.090	1.519	0.0000	5	0.005	0.000	0	0.0417	457.5	61	586	75.5	M	M
06010202050030	Little Tenn	14911	0.688	4.230	0.078	28.952	17.875	191	0.006	0.142	1.551	0.0000	5	0.000	0.000	0	0.0417	639.5	114	660	122	G	H
06010202050040	Little Tenn	216	0.056	14.586	#####	24.571	15.097	5	0.000	0.311	1.460	0.0404	5	0.000	0.000	0	0.0417	762.5	137	606.5	88	G	M
06010202050050	Little Tenn	8388	0.430	3.079	3.572	27.690	17.215	115	0.013	0.093	1.495	0.0013	5	0.000	0.000	0	0.0417	682	120	614.5	96.5	G	M
06010202060010	Little Tenn	17523	0.134	3.258	0.689	27.507	17.109	125	0.007	0.093	1.491	0.0000	5	0.000	0.000	0	0.0417	747.5	135	662	124	G	H
06010202060020	Little Tenn	3799	0.425	3.882	2.061	24.561	15.093	49	0.051	0.058	1.383	0.0213	5	0.000	0.000	0	0.0417	793.5	142	572.5	64	G	M
06010202060030	Little Tenn	2531	0.147	9.161	16.752	24.562	15.081	38	0.010	0.055	0.739	0.6273	5	0.000	0.000	0	0.0417	737.5	131	584.5	73.5	G	M
06010202060040	Little Tenn	20036	0.056	2.897	1.006	24.618	15.130	115	0.057	0.080	1.598	0.0000	5	0.000	0.000	0	0.0417	735	130	622	101	G	M
06010202060050	Little Tenn	2556	0.528	3.888	4.112	24.598	15.033	52	0.000	0.064	1.407	0.0496	5	0.000	0.000	0	0.0417	809	143	561.5	56	G	M
06010202060060	Little Tenn	2218	0.280	3.966	5.630	24.561	15.089	38	0.001	0.082	1.462	0.0375	5	0.000	0.000	0	0.0417	745.5	133.5	569.5	61.5	G	M
06010202060070	Little Tenn	2834	0.000	3.375	21.660	24.560	15.078	12	0.048	0.051	1.380	0.0389	5	0.000	0.000	0	0.0417	748.5	136	549.5	48.5	G	M
06010202070010	Little Tenn	14543	0.793	3.777	5.060	27.365	11.084	199	0.023	0.116	1.461	0.0075	4	0.000	0.000	0	0.0408	692	124	655.5	120	G	H

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06010202070020	Little Tenn	22681	0.490	3.191	0.256	27.363	11.090	283	0.052	0.084	1.435	0.0118	4	0.000	0.000	0	0.0408	769	138	645.5	112	G	H
06010202080040	Little Tenn	6455	0.040	7.306	18.532	25.879	13.063	18	0.016	0.066	0.459	0.7162	4	0.000	0.000	0	0.0400	700	126	648.5	116	G	H
06010203010010	Little Tenn	27643	0.682	3.349	3.812	67.474	23.411	449	0.051	0.056	1.952	0.0090	4	0.000	0.114	0	0.0426	378.5	32	439.5	12	P	L
06010203010020	Little Tenn	26594	0.192	2.475	5.309	67.456	23.425	247	0.089	0.046	1.845	0.0249	4	0.000	0.000	0	0.0426	387.5	34	480	19	P	M
06010203010030	Little Tenn	23536	0.005	2.777	2.662	67.432	23.431	309	0.203	0.019	1.829	0.0640	4	0.000	0.000	1	0.0426	292	12	365.5	5	P	L
06010203010050	Little Tenn	13162	0.157	2.531	12.022	67.456	23.424	176	0.179	0.019	1.562	0.0000	4	0.000	0.000	0	0.0426	276.5	8	558.5	55	P	M
06010203010060	Little Tenn	32898	0.672	2.010	1.968	67.501	23.406	439	0.050	0.044	1.809	0.0000	4	0.000	0.000	0	0.0426	419.5	45	567.5	59	M	M
06010203010070	Little Tenn	14891	0.241	1.845	2.530	67.445	23.428	149	0.159	0.021	1.678	0.0000	4	0.000	0.000	0	0.0426	449	58	542.5	46	M	M
06010203020010	Little Tenn	10604	0.002	3.020	13.249	67.456	23.424	132	0.395	0.018	1.068	0.0000	4	0.000	0.000	0	0.0435	290.5	11	634	104	P	H
06010203020020	Little Tenn	32677	0.028	3.235	2.008	67.498	23.406	410	0.169	0.059	1.553	0.0000	4	0.000	0.000	2	0.0435	332	17	550.5	51.5	P	M
06010203020030	Little Tenn	26183	0.269	3.166	3.098	67.429	23.430	294	0.167	0.060	1.632	0.0000	4	0.000	0.000	0	0.0435	302	15	606	87	P	M
06010203020040	Little Tenn	40508	0.141	3.305	0.220	51.549	21.865	337	0.123	0.066	1.371	0.0010	4	0.000	0.000	0	0.0435	437	54	641.5	109	M	H
06010203030080	Little Tenn	28854	0.003	2.966	1.190	67.392	23.409	18	0.049	0.049	1.438	0.0006	4	0.000	0.000	1	0.0408	592.5	105	568	60	M	M
06010203040010	Little Tenn	1488	0.013	9.550	46.668	24.559	15.078	0	0.013	0.085	1.034	0.6768	4	0.000	0.000	0	0.0426	773	139	640	108	G	H
06010203040050	Little Tenn	7076	0.159	3.330	3.052	24.561	15.087	63	0.148	0.042	1.193	0.0325	4	0.000	0.000	0	0.0426	585.5	100	581	70.5	M	M
06010204010010	Little Tenn	19160	0.524	4.408	1.359	27.430	11.116	330	0.177	0.083	1.472	0.0000	4	0.000	0.000	0	0.0392	588	101.5	712	135	M	H
06010204010020	Little Tenn	8755	0.222	3.664	12.010	27.373	11.077	119	0.146	0.081	1.452	0.0000	4	0.000	0.000	0	0.0392	687.5	122	716	136	G	H
06010204010030	Little Tenn	7447	0.464	4.439	1.706	27.379	11.079	143	0.125	0.128	1.296	0.0000	4	0.000	0.000	0	0.0392	744.5	132	772	140	G	H
06010204020010	Little Tenn	29896	0.486	4.313	1.381	27.406	11.097	533	0.020	0.122	1.512	0.0078	4	0.000	0.000	0	0.0435	604	107	614.5	96.5	G	M
06010204020020	Little Tenn	2729	0.084	9.911	47.994	27.373	11.078	41	0.028	0.044	0.579	0.7108	4	0.000	0.000	0	0.0435	658.5	117	583.5	72	G	M
06010204020030	Little Tenn	10522	0.428	4.007	9.890	27.374	11.076	135	0.056	0.104	1.480	0.0166	4	0.000	0.000	0	0.0435	666.5	119	607.5	89	G	M
06010204020040	Little Tenn	32815	0.739	3.501	0.604	27.373	11.076	424	0.006	0.105	1.466	0.0180	4	0.000	0.000	0	0.0435	745.5	133.5	608.5	90.5	G	M
06010204020050	Little Tenn	26387	0.768	3.666	1.371	27.373	11.075	431	0.036	0.118	1.436	0.0001	4	0.000	0.000	1	0.0435	723	128	611	92.5	G	M
06010204020060	Little Tenn	6644	0.996	4.290	8.326	27.373	11.077	80	0.000	0.124	1.557	0.0008	4	0.000	0.000	0	0.0435	780.5	140	628.5	103	G	M
06010204020070	Little Tenn	23921	0.258	3.692	1.087	25.457	13.681	173	0.011	0.100	1.509	0.0512	4	0.000	0.000	0	0.0435	689	123	577.5	66	G	M
06010204030010	Little Tenn	6847	0.870	4.080	9.744	53.200	20.423	185	0.016	0.033	1.618	0.0000	3	0.000	0.000	0	0.0444	615.5	108	605.5	86	G	M
06020002050010	Hiwassee	13412	0.070	3.713	1.228	40.814	22.642	78	0.345	0.008	0.728	0.2313	3	0.000	0.000	0	0.0417	548	87	600.5	84	M	M
06020002050020	Hiwassee	23354	0.556	3.170	3.316	40.814	22.641	275	0.177	0.043	1.501	0.0000	3	0.000	0.000	0	0.0417	424	49.5	676	127	M	H
06020002060010	Hiwassee	17590	0.009	3.785	4.064	40.814	22.642	66	0.376	0.047	0.937	0.0009	3	0.000	0.000	0	0.0222	497.5	72	730	138	M	H
06020002070010	Hiwassee	29622	0.584	3.344	3.065	40.817	22.642	335	0.109	0.054	1.400	0.0000	3	0.000	0.000	0	0.0222	456.5	60	747.5	139	M	H
06020002071010	Hiwassee	19107	0.817	4.253	11.532	40.822	22.640	243	0.018	0.142	1.520	0.0022	3	0.000	0.414	0	0.0222	550	88.5	647.5	115	M	H
06020002100010	Hiwassee	26681	0.583	5.772	2.444	53.361	20.469	542	0.078	0.190	1.481	0.0000	3	0.023	0.028	0	0.0208	470.5	65	661	123	M	H
06020002100020	Hiwassee	39495	0.324	5.971	1.439	53.378	20.463	###	0.169	0.161	1.292	0.0000	3	0.071	0.000	6	0.0208	339	19.5	674	126	P	H
06020002100030	Hiwassee	10155	0.075	4.689	0.396	53.402	20.465	267	0.209	0.077	1.243	0.0000	3	0.072	0.000	5	0.0208	430	52	644	111	M	H
06020002100040	Hiwassee	13833	0.230	5.483	10.766	53.375	20.470	267	0.241	0.116	1.301	0.0000	3	0.000	0.000	0	0.0208	404	38	820.5	142	M	H
06020002100050	Hiwassee	2258	0.155	6.113	42.192	53.267	20.481	11	0.373	0.091	1.139	0.0000	3	0.000	0.000	0	0.0208	424.5	51	819.5	141	M	H

HUCODE	River Basin	Acres	Proportion NFL	Stream density mi/mi2	Road density mi/mi2	2000 Population density/mi2	% Pop density Change 90-00	Stream Crossings	Non Point Source	Proportion Riparian	Weighted Eros Hazard	Proportion lakes	Aquatic PETS	Proportion Impaired	Proportion ORW or NSW	Municipal Supply	Endemic Fish	Overall Condition	AR Overall Condition	Overall Vulnerability	AR Overall Vulnerability	RAP watershed condition	RAP watershed vulnerability
06020002110010	Hiwassee	34117	0.360	3.129	0.527	53.386	20.463	551	0.044	0.056	1.435	0.0321	4	0.000	0.000	0	0.0196	578.5	97	620	99.5	M	M
06020002170020	Hiwassee	32131	0.117	3.151	5.433	53.402	20.466	252	0.119	0.046	1.555	0.0234	3	0.000	0.000	0	0.0222	363	28	593	80	P	M
06020002170030	Hiwassee	3755	0.694	4.206	24.217	53.401	20.463	27	0.177	0.063	1.462	0.0764	3	0.000	0.000	0	0.0222	567	93	638	106	M	H
06020002180010	Hiwassee	51260	0.375	3.040	0.812	53.402	20.466	495	0.089	0.027	1.393	0.0720	6	0.000	0.000	0	0.0200	419	44	518.5	38	M	M
06020002180020	Hiwassee	31801	0.270	2.583	0.000	53.402	20.466	196	0.047	0.038	1.416	0.0337	6	0.000	0.000	0	0.0200	552	90.5	538.5	44	M	M
06020002180030	Hiwassee	13834	0.941	2.745	0.042	53.402	20.466	88	0.012	0.058	1.462	0.0006	6	0.000	0.000	0	0.0200	728	129	611.5	94	G	M

Figure AC-1, 6th Level Hydrologic Unit Locations, can be used to locate individual 6th level HUCs by number.

Watershed Aquatic Biota Vulnerability

Figure IV-5, page IV-19, Aquatic Biota Vulnerability by 6th Level HUC, graphically displays the overall vulnerability of each hydrologic unit.

6th level HUC	% Roads Parrelling Streams	Stream Crossing Rate	Trout Population Rate	% Brook Trout Rate	AQUATIC BIOTA VULNERABILITY RATING
03040101010010	2	0	1	2	H
03050101010010	2	1	0	0	M
03050101010020	1	1	0	0	L
03050101010030	2	1	0	0	M
03050101010050	2	1	1	0	M
03050101010060	1	1	1	0	M
03050101020010	1	1	0	0	L
03050101020020	1	1	0	0	L
03050101020030	0	1	0	0	L
03050101030020	2	1	0	0	M
03050101030030	1	0	0	0	L
03050101060010	1	2	2	2	H
03050101060020	0	0	0	0	L
03050101060030	1	1	1	0	M
03050101070010	1	2	2	1	H
03050101070020	1	1	2	2	H
03050101070030	2	2	2	2	H
03050101070040	1	1	0	0	L
03060101010010	1	0	0	0	L
03060101010020	0	0	1	0	L
03060101020010	0	1	2	2	H
03060102010010	1	1	2	2	H
03060102010020	1	1	2	2	H
03060102010030	1	0	0	0	L
03060102070010	2	0	1	1	M
06010103010010	0	0	1	2	M
06010103020010	2	1	0	0	M
06010105010010	2	2	2	0	H
06010105010020	2	2	1	0	H
06010105010030	0	0	1	0	L
06010105010050	2	1	1	2	H
06010105010060	1	1	2	2	H
06010105010070	1	2	2	1	H

6th level HUC	% Roads Parrelling Streams	Stream Crossing Rate	Trout Population Rate	% Brook Trout Rate	AQUATIC BIOTA VULNERABILITY RATING
06010105010080	0	0	1	0	L
06010105020015	0	0	1	0	L
06010105020020	0	2	2	1	H
06010105020030	2	1	2	1	H
06010105040010	0	0	1	0	L
06010105050010	1	2	1	2	H
06010105060020	1	1	1	2	H
06010105070010	0	0	2	1	M
06010105070020	0	0	1	0	L
06010105070030	0	0	1	2	M
06010105090030	0	0	1	0	L
06010105100040	1	1	1	0	M
06010105110010	1	2	2	1	H
06010105120010	0	0	1	0	L
06010105120020	1	1	1	2	H
06010105120030	1	1	1	2	H
06010105120040	2	1	0	0	M
06010105130010	0	1	1	0	L
06010105130020	0	0	1	0	L
06010105130030	2	2	2	0	H
06010105130040	2	1	1	0	M
06010105140010	0	1	1	1	M
06010106010010	2	1	2	2	H
06010106010020	1	1	2	2	H
06010106020040	1	1	1	0	M
06010106020050	1	1	0	0	L
06010106020060	1	0	1	0	L
06010106020070	1	2	2	1	H
06010108010010	2	1	0	0	M
06010108010040	0	1	0	0	L
06010108020010	1	2	0	0	M
06010108060010	2	1	0	0	M
06010108060020	0	1	0	0	L
06010108070010	2	1	0	0	M
06010108080040	2	1	0	0	M
06010108100010	2	2	0	0	M
06010108100020	2	1	0	0	M
06010202020010	1	1	1	0	M
06010202020020	1	2	2	2	H
06010202020030	1	2	2	1	H
06010202030010	2	2	2	2	H

6th level HUC	% Roads Parrelling Streams	Stream Crossing Rate	Trout Population Rate	% Brook Trout Rate	AQUATIC BIOTA VULNERABILITY RATING
06010202030020	1	1	1	1	M
06010202030030	2	1	1	2	H
06010202040010	1	1	1	0	M
06010202040020	1	2	2	1	H
06010202040030	1	1	1	0	M
06010202040040	1	1	1	1	M
06010202050010	1	2	2	1	H
06010202050020	1	2	2	2	H
06010202050030	1	1	2	1	H
06010202050050	2	1	1	0	M
06010202060010	2	1	1	0	M
06010202060020	1	1	0	0	L
06010202060030	2	0	0	0	L
06010202060040	1	0	1	2	M
06010202060050	1	1	0	0	L
06010202060060	1	1	0	0	L
06010202070010	1	1	2	1	H
06010202070020	1	2	1	0	M
06010202080040	1	0	0	0	L
06010203010010	1	2	2	2	H
06010203010020	1	1	1	2	H
06010203010030	0	0	1	2	M
06010203010050	2	1	1	2	H
06010203010060	1	2	2	2	H
06010203010070	0	1	1	2	M
06010203020010	0	0	1	0	L
06010203020020	0	0	1	0	L
06010203020030	1	1	2	2	H
06010203020040	1	1	1	1	M
06010203030080	0	0	0	0	L
06010203040020	0	0	1	0	L
06010203040050	2	1	0	0	M
06010203070070	0	0	0	0	L
06010204010010	1	2	2	0	H
06010204010020	1	1	1	0	M
06010204010030	1	1	1	0	M
06010204020010	2	2	2	2	H
06010204020020	2	0	0	0	L
06010204020030	1	1	1	0	M
06010204020040	1	2	2	2	H
06010204020050	1	2	2	0	H

6th level HUC	% Roads Parrelling Streams	Stream Crossing Rate	Trout Population Rate	% Brook Trout Rate	AQUATIC BIOTA VULNERABILITY RATING
06010204020060	0	0	1	2	M
06010204020070	1	1	1	0	M
06010204030010	0	1	2	2	H
06020002050010	0	0	0	0	L
06020002050020	1	2	1	2	H
06020002070010	0	2	2	1	H
06020002071010	1	2	1	0	M
06020002100010	2	2	1	0	H
06020002100020	2	2	1	0	H
06020002100040	1	1	0	0	L
06020002100050	0	0	0	0	L
06020002110010	0	2	1	2	H
06020002110020	0	0	0	0	L
06020002170020	1	1	1	0	M
06020002170030	1	1	0	0	L
06020002180010	1	2	1	0	M
06020002180020	1	1	1	2	H
06020002180030	1	2	1	0	M
06020003100030	0	0	0	0	L

Road-Specific Aquatic Biota Vulnerability Ratings Table

FDR #	Local Road Name	6th level HUC	Original Aquatic Biota Rating (watershed)	District	length of open road (miles)	length of open road (feet)	length of road paralleling stream (feet)	percent of road paralleling stream	% parallel rating (0=low, 1=med, 2=high)	Number of stream crossings (all types)	# crossings (all types) rating (0=low, 1=med, 2=high)	Are there trout in the stream? (0=no, 1=yes)	Are there brook trout in the stream? (0=no, 1=yes)	total rating	aquatic biota vulnerability rating
42	CAMP CREEK BALD	06010105130030	2	Appalachian - FB	0.8	4224	0.0	0	0	0	0	0	0	0	low
45	WATAUGA TURNPIKE	03050101070030	2	Grandfather	4.6	24056	0.0	0	0	1	1	1	0	2	medium
50	SHULER CREEK	06020002180030	1	Tusquitee	3.0	15840	7214.7	46	2	14	2	1	0	5	high
56	TALLULAH RIVER	03060102070010	1	Tusquitee	1.5	7920	1523.9	19	1	1	1	1	0	3	medium
57	CLIFFSIDE LAKE	06010202030010	2	Highlands	1.6	8448	1460.1	17	1	4	2	1	1	5	high
58	KAWANA	03050101070030	2	Grandfather	4.5	23992	694.7	3	1	3	1	1	1	4	medium
61	WAYAH OFFICE	06010202020030	2	Wayah	0.1	528	0.0	0	0	0	0	0	0	0	low
62	SLICKROCK	06010204020050	2	Cheoah	7.3	38544	11269.1	29	2	21	2	1	0	5	high
63	STONY FORK	06010105110010	2	Appalachian - TOE	4.1	21632	4955.1	23	1	3	1	1	1	4	medium
67	UPPER NANTAHALA	06010202020020	2	Wayah	11.8	62304	5831.7	9	1	8	2	1	1	5	high
69	WAYAH BALD	06010202020030	2	Wayah	4.6	24288	429.6	2	1	1	1	1	0	3	medium
70	COWEE BALD	06010202040030	1	Wayah	7.5	39600	593.2	1	1	6	2	1	0	4	medium
71	DEEP GAP	06010202020020	2	Wayah	5.9	31152	6852.3	22	1	3	1	1	1	4	medium
74	BIG IVY	06010105110010	2	Appalachian - TOE	8.7	45888	6647.9	14	1	18	2	1	1	5	high
75	SNOWBIRD	06010204020010	2	Cheoah	4.1	21648	10891.5	50	2	13	2	1	0	5	high
77	BROWN GAP	03060102010020	2	Highlands	0.9	4752	802.4	17	1	0	0	1	0	2	medium
79	BLUE VALLEY	03060102010020	2	Highlands	5.2	27456	2141.8	8	1	5	2	1	1	5	high
80	COPPER CR.	06020002180010	1	Tusquitee	2.5	13200	1484.1	11	1	9	2	0	0	3	medium

FDR #	Local Road Name	6th level HUC	Original Aquatic Biota Rating (watershed)	District	length of open road (miles)	length of open road (feet)	length of road paralleling stream (feet)	percent of road paralleling stream	% parallel rating (0=low, 1=med, 2=high)	Number of stream crossings (all types)	# crossings (all types) rating (0=low, 1=med, 2=high)	Are there trout in the stream? (0=no, 1=yes)	Are there brook trout in the stream? (0=no, 1=yes)	total rating	aquatic biota vulnerability rating
81	UPPER SANTEETLAH	06010204020040	2	Cheoah	10.6	56126	13451.3	24	1	15	2	1	1	5	high
83	BALL CREEK	06010202020010	2	Wayah	6.9	36627	5226.9	14	1	5	2	1	1	5	high
84	MICKENS BRANCH		1	Tusquitee	1.5	7920	0.0	0	0	0	0	0	0	0	low
85	PANTHER TOP	06020002170030	0	Tusquitee	2.5	13200	256.3	2	1	4	2	1	0	4	medium
86	CONNELLY CR	06010202060040	1	Wayah	3.7	19694	6014.3	31	2	10	2	1	0	5	high
90	LBJ	06010202020030	2	Wayah	0.3	1584	287.8	18	1	1	1	1	0	3	medium
95	ARROWOOD GLADE	06010202020030	2	Wayah	0.1	718	951.1	132	2	2	1	0	0	3	medium
99	TABLE ROCK		1	Grandfather	2.9	15132	0.0	0	0	0	0	0	0	0	low
111	BIG CREEK	06010105130030	2	Appalachian - FB	1.4	7392	3581.3	48	2	3	1	1	0	4	medium
113	MILL RIDGE	06010105120040	2	Appalachian - FB	1.0	5280	653.3	12	1	0	0	0	0	1	medium
116	MORTIMER R.A.		2	Grandfather	0.4	2006	376.3	19	1	1	1	1	0	3	medium
118	BACK-IRISH CREEK	03050101060030	1	Grandfather	2.8	14895	5046.4	34	2	13	2	1	0	5	high
130	ROAN MOUNTAIN	06010108060010	0	Appalachian - TOE	0.9	4942	0.0	0	0	0	0	1	0	1	medium
139	OGREETA CEMETERY	06020002180010	1	Tusquitee	0.5	2640	379.0	14	1	1	1	1	0	3	medium
140	COURTHOUSE CR	06010105010010	2	Pisgah	3.4	17688	12315.3	70	2	7	2	1	0	5	high
142	H'VILLE RESERVOIR	06010105020020	2	Pisgah	0.5	2640	1782.1	68	2	2	1	1	0	4	medium
148	COLD SPRINGS	06010106020070	2	Appalachian - FB	6.1	32182	16704.4	52	2	17	2	0	0	4	medium
160	PINK BEDS PICNIC AREA	06010105020030	2	Pisgah	0.1	528	0.0	0	0	0	0	0	0	0	low

FDR #	Local Road Name	6th level HUC	Original Aquatic Biota Rating (watershed)	District	length of open road (miles)	length of open road (feet)	length of road paralleling stream (feet)	percent of road paralleling stream	% parallel rating (0=low, 1=med, 2=high)	Number of stream crossings (all types)	# crossings (all types) rating (0=low, 1=med, 2=high)	Are there trout in the stream? (0=no, 1=yes)	Are there brook trout in the stream? (0=no, 1=yes)	total rating	aquatic biota vulnerability rating
161	CAROLINA HEMLOCKS	06010108020010	1	Appalachian - TOE	1.0	5211	0.0	0	0	0	0	0	0	0	low
162	SILVERMINE	06010105120040	1	Appalachian - FB	0.4	2112	2286.7	108	2	0	0	0	0	2	medium
187	MAPLE-SALLY	03050101070010	2	Grandfather	17.1	90367	7264.1	8	1	14	2	1	0	4	medium
192	ROSEBORO GRAGG	03050101070030	2	Grandfather	6.5	34542	2417.9	7	1	10	2	1	1	5	high
197	RAVEN CLIFF	03050101060010	2	Grandfather	1.5	7857	6798.7	87	2	3	1	1	0	4	medium
210	ROSES CREEK	03050101030020	1	Grandfather	13.4	70932	4509.3	6	1	9	2	1	0	4	medium
223	PUNCHEON CAMP	06010105120030	2	Appalachian - FB	2.2	11616	1010.0	9	1	4	2	1	0	4	medium
225	COVE CREEK	06010105010070	2	Pisgah	2.5	13200	1131.3	9	1	3	1	1	1	4	medium
228	STEELES CREEK	03050101060010	2	Grandfather	3.9	20439	1408.2	7	1	1	1	1	0	3	medium
229	PILOT MTN.	06010105010010	2	Pisgah	2.7	14256	0.0	0	0	0	0	0	0	0	low
231	LOWER STAIRE	06010105110010	2	Appalachian - TOE	0.6	2957	300.3	10	1	1	1	1	0	3	medium
233	HAYNES	06010106020070	2	Appalachian - FB	6.1	32208	14243.6	44	2	5	2	1	0	5	high
235	PIGEONROOST	06010108100010	1	Appalachian - TOE	3.0	16009	9621.9	60	2	14	2	1	1	6	high
239	LOCUST CREEK	06010108020010	1	Appalachian - TOE	0.7	3696	685.8	19	1	2	1	1	1	4	medium
248	JACKRABBIT MTN	06020002050010	0	Tusquitee	2.7	14256	0.0	0	0	0	0	0	0	0	low
256	BIG EAST FORK	06010106010010	0	Pisgah	0.1	528	0.0	0	0	0	0	0	0	0	low
257	SYCAMORE FLATS REC AREA	06010105010070	2	Pisgah	0.3	1584	108.6	7	1	0	0	1	0	2	medium
258	SUNBURST REC AREA	06010106010020	2	Pisgah	0.3	1584	0.0	0	0	0	0	1	0	1	medium

FDR #	Local Road Name	6th level HUC	Original Aquatic Biota Rating (watershed)	District	length of open road (miles)	length of open road (feet)	length of road paralleling stream (feet)	percent of road paralleling stream	% parallel rating (0=low, 1=med, 2=high)	Number of stream crossings (all types)	# crossings (all types) rating (0=low, 1=med, 2=high)	Are there trout in the stream? (0=no, 1=yes)	Are there brook trout in the stream? (0=no, 1=yes)	total rating	aquatic biota vulnerability rating
260	TULALAH RAILROAD		1	Cheoah	1.0	5280	216.6	4	1	0	0	0	0	1	medium
264	LITTLE EAST FORK	06010106010020	2	Pisgah	0.3	1584	119.0	8	1	1	1	1	1	4	medium
275	SUGARLOAF MOUNTAIN	06010105130030	2	Appalachian - FB	1.2	6336	1389.7	22	1	8	2	0	0	3	medium
286	REDMAN	06010106020040	1	Appalachian - FB	2.4	12503	864.7	7	1	3	1	0	0	2	medium
287	LONGARM	06010106020060	0	Appalachian - FB	2.9	15312	563.2	4	1	3	1	1	1	4	medium
288	BUZZARD ROOST	06010106020070	2	Appalachian - FB	11.1	58656	5481.0	9	1	13	2	1	1	5	high
289	OLD BUZZARD ROOST	06010106020070	2	Appalachian - FB	2.0	10560	2040.8	19	1	5	2	1	0	4	medium
294	N. MILLS RIVER REC AREA	06010105020020	2	Pisgah	0.9	4752	172.5	4	1	1	1	1	0	3	medium
297	TURKEYPEN	06010105020015	0	Pisgah	1.5	7920	0.0	0	0	1	1	1	0	2	medium
298	CHECK STA.	06010105010070	2	Pisgah	0.7	3696	3404.2	92	2	2	1	1	0	4	medium
299	BROWN MOUNTAIN	03050101070040	0	Grandfather	0.9	4752	2394.3	50	2	4	2	1	0	5	high
301	WILSON LAKE	03060102010020	2	Highlands	0.8	3960	347.5	9	1	0	0	1	0	2	medium
304	WEBB MILL	06020002100020	2	Tusquitee	10.4	54912	5166.1	9	1	12	2	1	0	4	medium
307	BEECH CREEK	06020002170030	1	Tusquitee	10.0	52800	3989.9	8	1	20	2	1	0	4	medium
308	BEACHERTOWN	06010202050020	2	Wayah	3.4	17952	6919.3	39	2	1	1	1	0	4	medium
313	LAKE CHEROKEE	06020002180010	1	Tusquitee	0.6	3168	103.5	3	1	0	0	0	0	1	medium
316	LOCUST TREE	06010202020030	2	Wayah	0.3	1584	2854.9	180	2	5	2	1	0	5	high
317	RATTLER FORD	06010204020040	2	Cheoah	0.9	4752	1639.2	34	2	3	1	1	0	4	medium

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319	TUSQUITEE OFFICE	06020002170020	1	Tusquitee	0.2	1056	77.4	7	1	1	1	0	0	2	medium
320	MURPHY R/W	06020002100030		Tusquitee	0.8	3960	0.0	0	0	0	0	0	0	0	low
321	RANGER OFFICE	06010204020010	2	Cheoah	0.2	1056	694.1	66	2	3	1	0	0	3	medium
322	VAN HOOK	06010202030010	2	Highlands	0.3	1584	0.0	0	0	0	0	0	0	0	low
323	FLAT BRANCH	06010202030030	1	Highlands	4.2	22176	934.6	4	1	1	1	1	0	3	medium
325	BRYSON BRANCH	06010202030030	2	Highlands	1.0	5280	1563.9	30	2	2	1	1	1	5	high
326	WILDCAT CREEK	06010202030030	2	Highlands	0.4	2112	0.0	0	0	0	0	0	0	0	low
328	WHITE WATER FALLS	03060101020010	2	Highlands	0.4	2112	0.0	0	0	0	0	0	0	0	low
330	RANGER RESIDENCE	06010204020010	2	Cheoah	0.1	528	246.0	47	2	1	1	1	0	4	medium
331	HIGHLANDS W.C.	06010202030010	2	Highlands	0.2	1056	0.0	0	0	0	0	0	0	0	low
332	HIGHLANDS OFFICE COMPLEX	06010202030010	2	Highlands	0.2	1056	0.0	0	0	0	0	0	0	0	low
335	RANGER RESIDENCE	03060102010020	2	Highlands	0.1	528	213.4	40	2	0	0	0	0	2	medium
340	FIRES CREEK	06020002071010	1	Tusquitee	12.4	65472	17089.2	26	2	11	2	1	0	5	high
348	OLD 64 HWY	06010202050010	2	Tusquitee	2.0	10560	5798.3	55	2	7	2	1	0	5	high
350	PERRY GAP	06010202050010	2	Tusquitee	4.0	21120	4171.2	20	1	3	1	1	0	3	medium
351	NELSON RIDGE	06020002070010	2	Tusquitee	6.5	34320	1963.7	6	1	8	2	1	0	4	medium
367	LITTLE YELLOW MTN	03060102010020	2	Highlands	4.9	25872	1489.2	6	1	3	1	1	0	3	medium
383	ATOAH GAP	06010204010030	1	Cheoah	1.2	6325	2672.9	42	2	3	1	0	0	3	medium

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385	CORNSILK	06010204020010	2	Cheoah	0.8	4224	2569.1	61	2	4	2	0	0	4	medium
388	BOARDTREE	06010202020030	2	Wayah	5.2	27456	3079.6	11	1	6	2	0	0	3	medium
401	RICH GAP	03060102010020	2	Highlands	4.4	23232	262.8	1	1	1	1	1	1	4	medium
402	BIG OAK		2	Tusquitee	0.3	1584	59.5	4	1	0	0	1	0	2	medium
407	FARLEY COVE	06010204020040	2	Cheoah	5.5	28776	4088.1	14	1	10	2	0	0	3	medium
408	THREE FORK GAP	06020002180020	2	Tusquitee	1.5	7920	5.6	0	0	1	1	1	0	2	medium
409	HORSE COVE R. A.	06010204020040	2	Cheoah	0.2	1056	98.8	9	1	0	0	0	0	1	medium
412	DRY FALLS RESIDENCE	06010202030010	2	Highlands	0.6	3168	0.0	0	0	0	0	0	0	0	low
415	LEE CREEK	06010202020030	2	Wayah	2.2	11759	2296.2	20	1	8	2	1	1	5	high
416	JOYCE KILMER	06010204020040	2	Cheoah	0.6	3168	2628.3	83	2	0	0	1	0	3	medium
418	SHELL STAND	06010202070010	2	Cheoah	1.4	7170	4354.5	61	2	18	2	1	1	6	high
420	DAVIS CREEK	06020002110010	2	Tusquitee	3.9	20592	3985.5	19	1	7	2	1	1	5	high
421	DRYMAN FORK	06010202020020	2	Wayah	4.0	21094	1230.2	6	1	2	1	1	1	4	medium
422	WINDING STAIRS	06010202050030	2	Wayah	3.1	16109	2328.8	14	1	5	2	1	0	4	medium
423	TATHAM GAP	06010204010030	2	Tusquitee	7.7	40556	5743.8	14	1	14	2	1	0	4	medium
424	STANDING INDIAN	06010202050010	2	Wayah	0.5	2640	482.8	18	1	2	1	1	0	3	medium
427	BIG STAMP	06020002071010	1	Tusquitee	1.2	6336	2031.5	32	2	6	2	1	0	5	high
433	HOMESITE	06020002110010	2	Tusquitee	0.8	4224	0.0	0	0	0	0	1	0	1	medium

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436	DOC STILES	06020002180010	1	Tusquitee	1.7	8976	0.0	0	0	0	0	1	0	1	medium
437	RAINBOW SPRINGS	06010202050010	2	Wayah	12.4	65498	2644.5	4	1	14	2	1	1	5	high
440	TUNI GAP	06010202050010	2	Tusquitee/Wayah	5.7	30096	3376.3	11	1	6	2	1	0	4	medium
441	AMMONS	03060102010010	2	Highlands	0.2	1056	382.2	36	2	1	1	1	0	4	medium
445	DEEP CREEK		2	Cheoah	1.9	10032	6264.5	62	2	10	2	1	0	5	high
446	MASSEY QUARRY	06010204020010	2	Cheoah	0.3	1584	216.2	14	1	1	1	1	0	3	medium
451	MARKS MOUNTAIN	03050101070030	2	Grandfather	2.8	14678	1305.6	9	1	3	1	1	0	3	medium
452	BALD MTN R.A.	06010108120010	1	Appalachian - TOE	0.2	1315	0.0	0	0	0	0	1	0	1	medium
454	SCHENCK CCC	06010105010070	2	Pisgah	1.0	5280	762.8	14	1	2	1	1	0	3	medium
456	BARKHOUSE	03050101060010	2	Grandfather	0.2	1056	0.0	0	0	0	0	0	0	0	low
458	WISEMANS VIEW	03050101030020	0	Grandfather	0.4	2086	0.0	0	0	0	0	0	0	0	low
460	OLD FORT	03050101010010	1	Grandfather	0.1	676	20.2	3	1	0	0	0	0	1	medium
463	CHEOAH POINT R.A.	06010204020030	1	Cheoah	0.8	4224	0.0	0	0	0	0	0	0	0	low
464	EDGEMONT PINOLA	03050101070030	2	Grandfather	9.0	47715	0.0	0	0	0	0	0	0	0	low
465	HICKEY FORK	06010105130030	2	Appalachian - FB	3.8	19800	13888.3	70	2	11	2	1	1	6	high
467	HURRICANE GAP	06010105130040	1	Appalachian - FB	4.3	22704	9696.9	43	2	17	2	1	0	5	high
468	POLECAT HOLLER	06010105140010	1	Appalachian - FB	2.0	10560	10289.0	97	2	19	2	0	0	4	medium
470	LITTLE BUCK CREEK	03050101010050	1	Grandfather	4.2	22144	8383.8	38	2	7	2	1	1	6	high

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471	CATHEYS CREEK	06010105010060	2	Pisgah	7.4	39072	17538.5	45	2	9	2	1	1	6	high
472	SOUTH TOE RIVER	03050101010020	1	Appalachian - TOE	7.5	39489	6078.2	15	1	7	2	1	1	5	high
473	PISGAH RANGER OFFICE	06010105010070	2	Pisgah	0.2	1056	0.0	0	0	0	0	0	0	0	low
474	ENGLISH CHAPEL DRIVE	06010105010070	2	Pisgah	0.2	1056	391.4	37	2	1	1	1	0	4	medium
475	DAVIDSON RIVER	06010105010010	2	Pisgah	7.5	39600	9039.8	23	1	9	2	1	1	5	high
476	WOLF FORD	06010105020030	2	Pisgah	1.8	9504	2015.5	21	1	3	1	1	1	4	medium
477	AVERY CREEK	06010105010070	2	Pisgah	7.4	39072	5933.2	15	1	6	2	1	0	4	medium
479	BENT CREEK	06010105050010	2	Pisgah	6.1	32208	5756.4	18	1	7	2	1	1	5	high
481	POWHATAN ACCESS	06010105050010	2	Pisgah	2.3	12144	807.3	7	1	1	1	1	0	3	medium
482	CURTIS CREEK	03050101010020	0	Grandfather	7.9	41728	5071.7	12	1	6	2	1	1	5	high
484	F. B. WORK CENTER	06010105120030	2	Appalachian - FB	0.3	1584	0.0	0	0	0	0	0	0	0	low
496	GINGERCAKE	03050101060010	2	Grandfather	7.2	37879	2310.6	6	1	8	2	1	1	5	high
498	PINE ROAD	06020002180030	1	Tusquitee	0.1	528	0.0	0	0	1	1	0	0	1	medium
499	OAK ROAD	06020002180030	1	Tusquitee	0.3	1584	0.0	0	0	1	1	0	0	1	medium
630	DRY FALLS LOOP	06010202030010	2	Highlands	0.2	1056	599.3	57	2	0	0	0	0	2	medium
650	HIBBERT BRANCH	06020002180010	1	Tusquitee	0.6	3168	692.5	22	1	8	2			3	medium
651	PERSIMMON CR	06020002180010	1	Tusquitee	1.0	5280	11.3	0	0	0	0	1	0	1	medium
653	OLD MURPHY HWY	06020002110010	2	Tusquitee	1.0	5280	911.2	17	1	3	1	0	0	2	medium

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654	HIAWASSEE CHURCH	06020002110010	2	Tusquitee	0.2	1056	0.0	0	0	14	2	1	1	4	medium
711	WINESPRGS WHITEOAK	06010202050010	2	Wayah	15.1	79728	6246.0	8	1	3	1	0	0	2	medium
713	SHINGLETREE BRANCH	06010202020030	2	Wayah	4.0	21120	504.9	2	1	5	2	1	0	4	medium
751	SHOPE FORK	06010202020020	2	Wayah	3.9	20502	6755.8	33	2	1	1	1	1	5	high
753	HEADQUARTERS SYSTEM	06010202020020	2	Wayah	0.3	1584	385.8	24	1	1	1	1	0	3	medium
763	JONES CREEK	06010202020030	2	Wayah	1.3	6727	4216.9	63	2	6	2	0	0	4	medium
787	SLIDING ROCK	06010105010070	2	Pisgah	0.1	528	531.9	101	2	1	1	1	0	4	medium
803	DAVIDSON RIVER C.G.	06010105010070	2	Pisgah	3.3	17424	834.2	5	1	1	1	1	0	3	medium
805	ROCKY BLUFF R.A.	06010105120030	2	Appalachian - FB	0.7	3696	0.0	0	0	0	0	0	0	0	low
812	CRADLE OF FORESTRY	06010105020030	2	Pisgah	0.3	1584	0.0	0	0	0	0	0	0	0	low
816	BLACK BALSAM		2	Pisgah	1.3	6864	0.0	0	0	0	0	0	0	0	low
954	FOX CAMP	03050101060010	2	Grandfather	0.3	1616	0.0	0	0	1	1	0	0	1	medium
981	ROSEBORO-EDGEMONT	03050101070030	2	Grandfather	4.5	23580	5054.4	21	1	3	1	1	0	3	medium
982	MORTIMER PIEDMONT	03050101060010	2	Grandfather	7.5	39600	8396.3	21	1	9	2	1	0	4	medium
985	LOWER UPPER CR	03050101060010	2	Grandfather	0.6	3078	279.0	9	1	1	1	1	0	3	medium
1001	BOONE FORK R.A.	03050101070020	2	Grandfather	0.6	3131	832.6	27	2	3	1	1	0	4	medium
1178	BULL PEN	03060102010010	2	Highlands	4.8	25344	6001.1	24	1	6	2	1	0	4	medium
1188	SUGAR COVE	03050101010050	1	Grandfather	1.3	7044	2304.9	33	2	2	1	1	0	4	medium

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1204	MORTIMER WORK CENTER	03050101070030	2	Grandfather	0.2	1056	0.0	0	0	0	0	0	0	0	low
1206	YELLOW GAP	06010105020020	2	Pisgah	13.1	69168	13023.5	19	1	23	2	1	0	4	medium
2055	BOONE FORK	03050101070020	2	Grandfather	2.0	10433	626.6	6	1	2	1	1	0	3	medium
2070	FISHING ACCESS	06020002110010	2	Tusquitee	0.1	528	0.0	0	0	0	0	0	0	0	low
2071	CHAMBERS CREEK	06020002180010	1	Tusquitee	2.1	11088	212.1	2	1	2	1	1	0	3	medium
2074	NEALS CREEK	06010108020010	1	Appalachian - TOE	2.4	12762	1028.8	8	1	3	1	1	0	3	medium
2320	FRANK ROGERS	06010204020010	2	Cheoah	0.5	2640	1083.9	41	2	2	1	1	0	4	medium
2321	CLYDE DAVIS	06010204020010	2	Cheoah	0.3	1320	99.0	8	1	0	0	0	0	1	medium
2322	LEWIS	06010204020010	2	Cheoah	0.2	1056	0.0	0	0	0	0	0	0	0	low
2369	BLUE BOAR	06010204020040	2	Cheoah	1.0	5280	1098.1	21	1	3	1	1	1	4	medium
2370	TEEOATLAH BRANCH	06010204020040	2	Cheoah	0.2	792	0.0	0	0	0	0	0	0	0	low
2387	ELLER BRANCH	06010204020010	2	Cheoah	0.3	1584	0.0	0	0	0	0	0	0	0	low
2409	AVEY BR BOAT RAMP	06010204020040	2	Cheoah	0.1	528	212.7	40	2	1	1	0	0	3	medium
2410	AVEY CREEK		1	Cheoah	0.1	528	0.0	0	0	0	0	0	0	0	low
2411	AVEY CAMP		1	Cheoah	0.1	528	0.0	0	0	0	0	0	0	0	low
2412	ATTOOGA BR. CAMP	06010204020040	2	Cheoah	0.2	792	0.0	0	0	0	0	0	0	0	low
2519	FARLEY CEMETERY	06010204020070	1	Cheoah	0.9	4752	439.0	9	1	2	1	0	0	2	medium
2524	FAX BRANCH RIDGE		1	Cheoah	0.1	528	0.0	0	0	0	0	0	0	0	low

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2535	BROOKSHIRE	06010202070020	1	Cheoah	0.5	2640	0.0	0	0	0	0	0	0	0	low
2537	LOWER STECOAH CR	06010202070020	1	Cheoah	0.3	1584	711.5	45	2	1	1	1	0	4	medium
2550	COUNTY LINE ROAD	06010202070010	2	Cheoah	0.2	1056	0.0	0	0	0	0	0	0	0	low
2553	LEMMONS BRANCH	06010202060030	0	Cheoah	1.5	7756	836.2	11	1	1	1	0	0	2	medium
2586	LONG HUNGRY BRANCH	06010204020040	2	Cheoah	2.7	14256	407.2	3	1	0	0	0	0	1	medium
2590	CHEOAH PT BOAT RAMP	06010204020030	1	Cheoah	0.1	528	0.0	0	0	0	0	0	0	0	low
2591	CHEOAH POINT SWIMMING/PICNIC	06010204020030	1	Cheoah	0.1	370	0.0	0	0	0	0	0	0	0	low
2598	MCKELDRY	06010204020010	2	Cheoah	0.1	528	0.0	0	0	0	0	0	0	0	low
2599	HELICOPTER PAD	06010204020010	2	Cheoah	0.3	1584	0.0	0	0	0	0	0	0	0	low
2600	WORK CENTER	06010204020010	2	Cheoah	0.2	1056	377.6	36	2	1	1	1	0	4	medium
2608	GREEN GAP	06010204010020	0	Cheoah	0.2	1056	1325.5	126	2	6	2	0	0	4	medium
2632	WATIA	06010202050030	2	Cheoah	0.7	3627	0.0	0	0	4	2	1	0	3	medium
2635	ROSE PLACE		2	Cheoah	0.8	4224	2128.6	50	2	0	0	1	0	3	medium
2800	LOWER HOOPER COVE		2	Cheoah	0.3	1426	69.4	5	1	0	0	1	0	2	medium
2807	MCGUIRES CABIN		1	Cheoah	0.3	1584	0.0	0	0	0	0	0	0	0	low
2811	WOLF LAUREL HUNTER CAMP	06010204020040	2	Cheoah	0.1	528	0.0	0	0	0	0	0	0	0	low
3505	CATPEN		2	Appalachian - FB	5.4	28512	4058.2	14	1	13	2	1	1	5	high
3506	BLUFF MT	06010105120030	1	Appalachian - FB	1.8	9504	1347.5	14	1	6	2	1	1	5	high

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3518	MURRAY BRANCH	06010105140010	1	Appalachian - FB	0.1	528	262.0	50	2	0	0	0	0	2	medium
3520	FLAT BRANCH	06010106020070	2	Appalachian - FB	1.5	7920	4161.0	53	2	4	2	0	0	4	medium
3521	LAURELETT	06010106020070	2	Appalachian - FB	0.8	4224	407.4	10	1	1	1	0	0	2	medium
3523	LAUREL CREEK	06010106020070	2	Appalachian - FB	0.3	1584	555.6	35	2	1	1	1	1	5	high
3537	SUTTON	06010106020070	2	Appalachian - FB	1.2	6178	0.0	0	0	0	0	0	0	0	low
3538	SUTTON TOWER	06010106020070	2	Appalachian - FB	0.4	1917	0.0	0	0	0	0	0	0	0	low
3543	GARENFLO GAP	06010105120030	2	Appalachian - FB	0.3	1320	1117.8	85	2	2	1	1	0	4	medium
3548	DOE BRANCH	06010105100040	1	Appalachian - FB	4.5	23760	1126.7	5	1	4	2	1	0	4	medium
3549	CATALOOCHEE	06010106020050	0	Appalachian - FB	3.2	16843	2074.8	12	1	6	2	1	0	4	medium
3550	ROCKY BRANCH	06010105100040	1	Appalachian - FB	0.6	3168	304.1	10	1	1	1	1	0	3	medium
3564	WILKINS CREEK	06010106020040	1	Appalachian - FB	0.6	3268	268.4	8	1	1	1	1	0	3	medium
3567	HADECEK	06010106020040	1	Appalachian - FB	0.7	3696	0.0	0	0	0	0	0	0	0	low
3570	HURRICANE RIDGE	06010106020070	2	Appalachian - FB	5.4	28512	1396.1	5	1	5	2	0	0	3	medium
3573	HAYWOOD HURRICANE SPUR	06010106020070	2	Appalachian - FB	1.3	7022	234.7	3	1	1	1	1	0	3	medium
4008	GOOD CEM	03050101020020	0	Grandfather	0.8	4330	0.0	0	0	0	0	0	0	0	low
4071	THUNDERHOLE	03050101070010	2	Grandfather	2.5	13200	1121.2	8	1	8	2	1	0	4	medium
4503	HOWARD GAP	06010202020010	1	Highlands	1.5	7920	207.5	3	1	0	0	0	0	1	medium
4522	JONES GAP	06010202030010	2	Highlands	2.0	10560	0.0	0	0	0	0	0	0	0	low

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4542	WHITESIDE	06010202030010	2	Highlands	0.1	528	0.0	0	0	0	0	0	0	0	low
4543	RATTLESNAKE ROAD	06010202030010	2	Highlands	0.2	1056	0.0	0	0	6	2	1	0	3	medium
4549	SHORTOFF	06010202030010	2	Highlands	1.0	5280	0.0	0	0	1	1	1	0	2	medium
4563	CHESTNUT MTN	03060102010020	2	Highlands	0.4	2112	0.0	0	0	0	0	0	0	0	low
4567	BIG CREEK	03060102010020	2	Highlands	2.0	10560	1003.4	10	1	1	1	1	0	3	medium
4610	LEDFORD BRANCH	06010202030020	1	Highlands	0.8	4224	0.0	0	0	0	0	0	0	0	low
4616	WALKING STICK	03060102010010	2	Highlands	1.4	7392	0.0	0	0	2	1	0	0	1	medium
4621	EVANS CREEK	06010202020020	2	Highlands	1.6	8448	632.2	7	1	2	1	0	0	2	medium
4624	COVEFIELD BR.	03060102010020	2	Highlands	1.3	6600	0.0	0	0	1	1	0	0	1	medium
4625	GREEN COVE	06010202020020	2	Highlands	0.5	2640	0.0	0	0	2	1	1	0	2	medium
4643	MULL CREEK	06010203010060	2	Highlands	3.0	15840	8276.5	52	2	6	2	1	0	5	high
4644	COPPERMINE	06010203010060	2	Highlands	2.5	13200	0.0	0	0	0	0	0	0	0	low
4646	CHASTINE CREEK	06010203010060	2	Highlands	2.0	10560	4141.9	39	2	2	1	1	0	4	medium
4648	GAGE CREEK	06010203010010	2	Highlands	0.4	2112	1707.0	81	2	1	1	1	1	5	high
4650	WAYEHUTTA	06010203010050	2	Highlands	0.9	4752	4955.8	104	2	5	2	1	1	6	high
4651	MOSES CREEK	06010203010060	2	Highlands	10.0	52800	3415.5	6	1	7	2	1	1	5	high
4652	OLD BALD RIDGE	06010203010060	2	Highlands	7.0	36960	0.0	0	0	0	0	0	0	0	low
4655	CHARLEY CREEK	06010203010010	2	Highlands	6.9	36432	811.0	2	1	4	2	1	1	5	high

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4657	CARETAKER	06010203010010	2	Highlands	0.1	528	63.8	12	1	0	0	0	0	1	medium
4659	COLD CREEK	06010203010010	2	Highlands	1.2	6336	0.0	0	0	0	0	0	0	0	low
4662	FLAT CREEK	06010203010010	2	Highlands	2.8	14784	273.8	2	1	1	1	1	0	3	medium
4663	COLD SPRING GAP	06010203010010	2	Highlands	6.7	35376	854.8	2	1	3	1	1	1	4	medium
4665	SUGAR CREEK GAP	06010203010020	2	Highlands	7.5	39600	1370.1	3	1	5	2	1	1	5	high
4666	PINEY MTN FLATS	06010203010060	2	Highlands	5.5	29040	3267.0	11	1	7	2	1	1	5	high
4668	BEECH FLAT CREEK	06010203010060	2	Highlands	2.4	12672	4007.8	32	2	2	1	1	1	5	high
4669	ROUGH BUTT	06010203010060	2	Highlands	4.0	21120	5512.3	26	2	2	1	1	1	5	high
4672	LAUREL FALLS	06010203010020	2	Highlands	1.0	5280	0.0	0	0	0	0	0	0	0	low
4674	HOGBACK ROAD	03060101010010	2	Highlands	4.0	21120	204.5	1	1	1	1	1	0	3	medium
4675	DRYLAND LAUREL BRANCH	06010203010060	2	Highlands	3.5	18480	335.7	2	1	1	1	1	1	4	medium
5000	WASH CREEK	06010105020020	2	Pisgah	6.2	32736	11139.1	34	2	9	2	1	0	5	high
5034	WOODS CEMETERY RD	06010105010020	2	Pisgah	0.2	1056	0.0	0	0	0	0	0	0	0	low
5093	PISGAH WORK CENTER	06010105010070	2	Pisgah	0.3	1584	0.0	0	0	0	0	0	0	0	low
5511	SEVEN MILE RIDGE	06010108010040	1	Appalachian - TOE	1.7	9113	880.5	10	1	2	1	1	1	4	medium
5523	COLBERTS CREEK	06010108020010	1	Appalachian - TOE	2.2	11616	645.3	6	1	1	1	1	1	4	medium
5544	BRIAR BOTTOM	06010108020010	1	Appalachian - TOE	0.7	3685	424.2	12	1	2	1	1	0	3	medium
5554	OGLE MEADOWS	06010105110010	1	Appalachian - TOE	1.9	10037	0.0	0	0	0	0	0	0	0	low

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5570	WHITE OAK FLATS	06010108100020	1	Appalachian - TOE	1.8	9715	1390.8	14	1	6	2	1	0	4	medium
5578	BOWLENS CREEK	06010108070010	1	Appalachian - TOE	0.5	2640	139.5	5	1	1	1	1	1	4	medium
5580	POPLAR BOAT RAMP	06010108100010	1	Appalachian - TOE	0.3	1748	0.0	0	0	0	0	0	0	0	low
5582	IRON MTN SOUTH	06010108060010	1	Appalachian - TOE	0.7	3902	0.0	0	0	1	1	1	0	2	medium
5583	EPHRAIM	06010108100010	1	Appalachian - TOE	0.9	4815	4199.3	87	2	18	2	1	0	5	high
6019	MOCCASIN CREEK	06020002180010	1	Tusquitee	0.4	2112	0.0	0	0	0	0	1	0	1	medium
6020	POWERLINE COVE	06020002180010	1	Tusquitee	2.9	15312	0.0	0	0	2	1	1	0	2	medium
6148	DERREBERRY GAP	06020002100020	2	Tusquitee	3.0	15840	1773.8	11	1	5	2	1	0	4	medium
6166	SCHOOLHOUSE BR	06020002100010	2	Tusquitee	2.6	13728	301.4	2	1	1	1	1	0	3	medium
6167	SHEARER CREEK	06020002070010	2	Tusquitee	1.0	5280	0.0	0	0	0	0	0	0	0	low
6230	DAVE BARRET BR.	06020002050020	2	Tusquitee	1.2	6336	1218.7	19	1	2	1	0	0	2	medium
6236	BARNETT CREEK	06010202050010	2	Tusquitee	1.1	5544	207.3	4	1	1	1	1	0	3	medium
6272	WHITNER BEND	06020002180010	1	Tusquitee	0.8	3960	82.5	2	1	6	2	1	0	4	medium
6274	WINDY RIDGE	06020002071010	1	Tusquitee	1.2	6336	951.9	15	1	3	1	0	0	2	medium
7000	GREASY BR DOCK	06010202060020	0	Wayah	0.1	528	0.0	0	0	0	0	0	0	0	low
7002	FLAT BR ACCESS	06010203040050	1	Wayah	0.5	2640	0.0	0	0	0	0	0	0	0	low
7018	SWAIN COUNTY LANDFILL	06010203040050	1	Wayah	0.2	1056	0.0	0	0	0	0	0	0	0	low
7019	SHUT IN GAP	06010203020040	0	Wayah	5.4	28406	1010.4	4	1	5	2	0	0	3	medium

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7052	YOUNCE CREEK	06010202040020	2	Wayah	0.3	1637	445.1	27	2	1	1	1	0	4	medium
7060	MOUSE MT	06010202040030	1	Wayah	0.5	2640	1227.2	46	2	3	1	1	0	4	medium
7061	GUNTER GAP	06010203020040	1	Wayah	0.9	4752	259.1	5	1	0	0	1	0	2	medium
7069	SILES BRANCH	06010204020040	2	Wayah	1.0	5280	530.0	10	1	2	1	1	0	3	medium
7070	BEASLEY CREEK	06010202040030	1	Wayah	0.3	1584	1270.2	80	2	1	1	1	0	4	medium
7071	FED COVE	06010202040030	1	Wayah	0.3	1637	0.0	0	0	1	1	1	0	2	medium
7072	BROWN CREEK	06010202040010	1	Wayah	0.6	3168	2156.8	68	2	0	0	1	0	3	medium
7073	BIRD FALLS	06010202050050	1	Wayah	0.5	2798	0.0	0	0	1	1	1	0	2	medium
7099	CHESTNUT ORCHARD BR	06010202050010	2	Wayah	0.3	1584	427.7	27	2	1	1	1	0	4	medium
7197	ONION MTN	06010202040010	1	Wayah	0.5	2640	0.0	0	0	0	0	0	0	0	low
7202	PUMPKINTOWN	06010203020030	2	Wayah	0.7	3696	2670.1	72	2	6	2	1	1	6	high
7280	JARRETT CREEK		2	Wayah	0.1	528	0.0	0	0	0	0	0	0	0	low
7285	FEREBEE MEMORIAL	06010202050030	2	Wayah	0.1	391	0.0	0	0	0	0	1	0	1	medium
7286	NANTAHALA LAUNCH	06010202050020	2	Wayah	0.2	1056	202.1	19	1	0	0	1	0	2	medium
7290	ANDY GAP	06010202020010	1	Wayah	0.3	1320	709.4	54	2	1	1	1	0	4	medium
7302	BREEDLOVE	06010202060010	1	Wayah	0.2	1056	0.0	0	0	0	0	0	0	0	low
7303	CHARLEY BR	06010202060010	1	Wayah	0.2	1056	994.4	94	2	2	1	0	0	3	medium
139A	OGREETA SPUR	06020002180010	1	Tusquitee	0.1	528	0.0	0	0	0	0	0	0	0	low

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148A	BROWN GAP	06010106020070	2	Appalachian - FB	1.2	6521	753.3	12	1	1	1	0	0	2	medium
148H	HORSE CAMP	06010106020070	2	Appalachian - FB	0.1	264	230.1	87	2	1	1	0	0	3	medium
210B	RICH COVE	03050101060030	1	Grandfather	1.5	7936	1181.9	15	1	2	1	1	0	3	medium
2369A	BLUE BOAR LODGE	06010204020040	2	Cheoah	0.7	3696	127.8	3	1	1	1	1	1	4	medium
248A	LOOP A	06020002050010	0	Tusquitee	0.4	2112	0.0	0	0	0	0	0	0	0	low
248B	LOOP B	06020002050010	0	Tusquitee	0.4	2112	0.0	0	0	0	0	0	0	0	low
248C	LOOP C	06020002050010	0	Tusquitee	0.2	1056	0.0	0	0	0	0	0	0	0	low
248D	BOAT RAMP	06020002050010	0	Tusquitee	0.2	1056	0.0	0	0	0	0	0	0	0	low
248E	BEACH	06020002050010	0	Tusquitee	0.2	1056	0.0	0	0	0	0	0	0	0	low
248F	MCCLURE ROAD	06020002050010	0	Tusquitee	0.5	2851	0.0	0	0	0	0	0	0	0	low
2536A	HYDE FARM	06010202070020	1	Cheoah	0.5	2851	582.7	20	1	1	1	0	0	2	medium
2536D	LOWER TUSKEEGEE	06010202070020	1	Cheoah	0.1	528	56.2	11	1	0	0	0	0	1	medium
294A	SOUTH LOOP A	06010105020020	2	Pisgah	0.4	2112	91.0	4	1	0	0	0	0	1	medium
294B	NORTH LOOP B	06010105020020	2	Pisgah	0.2	1056	241.7	23	1	1	1	1	0	3	medium
304A	MOODY STAMP	06010204020010	2	Cheoah	1.2	6389	645.1	10	1	0	0	1	0	2	medium
304A1	POPLAR SPRINGS		2	Cheoah	1.6	8448	1330.4	16	1	0	0	1	0	2	medium
307A	SEED ORCHARD	06020002170030	0	Tusquitee	2.1	11088	312.7	3	1	0	0	0	0	1	medium
307A1	SANDY GAP	06020002170030	1	Tusquitee	1.0	5280	0.0	0	0	0	0	0	0	0	low

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319A	RANGER RESIDENCE	06020002170020	1	Tusquitee	0.1	264	0.0	0	0	0	0	0	0	0	low
333A	HICKEY	06020002180020	2	Tusquitee	0.7	3696	93.9	3	1	0	0	0	0	1	medium
333A2	BURCH	06020002180020	2	Tusquitee	0.7	3696	0.0	0	0	0	0	0	0	0	low
333B	ANDERSON CR.	06020002180020	1	Tusquitee	0.6	3168	2706.4	85	2	0	0	0	0	2	medium
340A	ROCKHOUSE BR.	06020002071010	1	Tusquitee	1.8	9504	3723.4	39	2	4	2	1	0	5	high
340A1	PHILLIPS RIDGE	06020002071010	1	Tusquitee	3.5	18480	7702.1	42	2	17	2	1	0	5	high
340C	LONG BRANCH	06020002071010	1	Tusquitee	3.8	20064	5113.1	25	1	9	2	1	0	4	medium
340E	PICNIC LOOP	06020002071010	1	Tusquitee	0.1	528	751.3	142	2	0	0	1	0	3	medium
340G	HUNTERS CAMP	06020002071010	1	Tusquitee	0.3	1320	301.1	23	1	0	0	1	0	2	medium
340H	HUSKINS BRANCH	06020002071010	1	Tusquitee	0.4	2112	1183.3	56	2	0	0	1	0	3	medium
340N	HUNTERS WAY	06020002071010	1	Tusquitee	0.3	1584	2425.9	153	2	1	1	0	0	3	medium
340P	BAPTIZING HOLE	06020002071010	1	Tusquitee	0.1	264	0.0	0	0	0	0	1	0	1	medium
340R	WELL HOUSE	06020002071010	1	Tusquitee	0.1	528	0.0	0	0	0	0	1	0	1	medium
340U	BOTTOM CAMP	06020002071010	1	Tusquitee	0.3	1320	449.6	34	2	1	1	1	0	4	medium
340V	GRASS PATCH	06020002071010	1	Tusquitee	0.2	950	185.2	19	1	0	0	1	0	2	medium
340W	HORSE CAMP	06020002071010	1	Tusquitee	0.2	792	594.8	75	2	0	0	1	0	3	medium
340X	BRISTOL CABIN	06020002071010	1	Tusquitee	0.2	792	176.2	22	1	1	1	1	0	3	medium
340Y	BRISTOL FIELD OVERFLOW	06020002071010	1	Tusquitee	0.1	528	0.0	0	0	0	0	1	0	1	medium

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340Z	MULE FLATS	06020002071010	1	Tusquitee	0.2	792	270.0	34	2	1	1	0	0	3	medium
3505A	CATPEN EXT	06010105120020	2	Appalachian - FB	1.3	6864	1731.6	25	1	5	2	0	0	3	medium
350A	BUCK CREEK	06010202050010	2	Tusquitee	0.6	3168	2544.0	80	2	1	1	1	0	4	medium
3520A	SANDY JOHN RIDGE ROAD	06010106020070	2	Appalachian - FB	0.2	792	500.5	63	2	0	0	0	0	2	medium
3548A	GLADDEN RIDGE	06010105100040	1	Appalachian - FB	0.5	2482	82.1	3	1	0	0	0	0	1	medium
3571-1	HAYWOOD HURRICANE EXT	06010106020070	2	Appalachian - FB	1.1	5808	695.3	12	1	0	0	1	0	2	medium
420-1	TRAIL 1	06010204030010	2	Tusquitee	6.0	31680	4678.4	15	1	13	2	1	1	5	high
420-11	CHESTNUT MOUNTAIN	06010204030010	2	Tusquitee	1.5	7920	0.0	0	0	2	1	1	1	3	medium
420-12	HAWK KNOB	06010204030010	2	Tusquitee	1.2	6336	0.0	0	0	0	0	1	1	2	medium
420-2	TIPTON KNOB	06010204030010	1	Tusquitee	3.3	17424	4027.0	23	1	3	1	1	0	3	medium
420-3	BEAR PEN	06010204030010	2	Tusquitee	2.5	13200	2644.6	20	1	5	2	1	1	5	high
420-4	FAIN FORD	06010204030010	2	Tusquitee	4.7	24816	2477.2	10	1	5	2	1	1	5	high
420-5	TELLICO RIVER	06010204030010	2	Tusquitee	1.5	7920	4004.8	51	2	6	2	1	1	6	high
420-6	STATE LINE	06010204030010	2	Tusquitee	4.6	24288	0.0	0	0	0	0	1	1	2	medium
420-7	PECKERWOOD	06010204030010	2	Tusquitee	1.2	6336	2495.8	39	2	1	1	0	0	3	medium
420-8	BOB CREEK	06010204030010	2	Tusquitee	4.7	24816	4724.7	19	1	10	2	1	1	5	high
420-9	MISTLETOE	06010204030010	2	Tusquitee	1.1	5808	976.2	17	1	1	1	1	1	4	medium
420A	DOGTOWN	06020002110010	2	Tusquitee	0.3	1320	572.1	43	2	1	1	1	1	5	high

FDR #	Local Road Name	6th level HUC	Original Aquatic Biota Rating (watershed)	District	length of open road (miles)	length of open road (feet)	length of road paralleling stream (feet)	percent of road paralleling stream	% parallel rating (0=low, 1=med, 2=high)	Number of stream crossings (all types)	# crossings (all types) rating (0=low, 1=med, 2=high)	Are there trout in the stream? (0=no, 1=yes)	Are there brook trout in the stream? (0=no, 1=yes)	total rating	aquatic biota vulnerability rating
42	COLD SPRINGS GAP	06010202020020	2	Wayah	0.9	4752	0.0	0	0	0	0	0	0	0	low
423B	JOANNA TOWER	06010204010030	1	Cheoah	3.0	15808	874.8	6	1	2	1	0	0	2	medium
424A	STANDING INDIAN LOOP A	06010202050010	2	Wayah	0.3	1584	336.4	21	1	0	0	1	0	2	medium
424B	STANDING INDIAN LOOP B	06010202050010	2	Wayah	0.3	1584	0.0	0	0	0	0	1	0	1	medium
424C	STANDING INDIAN LOOP C	06010202050010	2	Wayah	0.3	1584	306.3	19	1	0	0	1	0	2	medium
424C1	KIMSEY CREEK GROUP CAMP	06010202050010	2	Wayah	0.2	1056	556.3	53	2	0	0	1	0	3	medium
424D	STANDING INDIAN LOOP D	06010202050010	2	Wayah	0.4	2112	103.2	5	1	0	0	1	0	2	medium
424E	STANDING INDIAN LOOP E	06010202050010	2	Wayah	0.2	1056	358.1	34	2	0	0	1	0	3	medium
424F	STD. INDIAN PICNIC LOOP	06010202050010	2	Wayah	0.1	528	0.0	0	0	0	0	1	0	1	medium
427A	BRUSHY RIDGE	06020002071010	1	Tusquitee	1.1	5808	958.6	17	1	2	1	0	0	2	medium
440A	BOB ALLISON	06020002070010	2	Tusquitee	0.1	528	0.0	0	0	0	0	0	0	0	low
4651A	ROCK BRANCH ROAD	06010203010060	2	Highlands	1.0	5280	1884.5	36	2	4	2	1	1	6	high
4651B	MOSES CREEK CAMP	06010203010060	2	Highlands	0.1	528	157.6	30	2	1	1	1	1	5	high
4651C	INDIAN CAMP	06010203010060	2	Highlands	4.0	21120	7314.2	35	2	7	2	1	1	6	high
4651C1	WEST FORK RIDGE	06010203010060	2	Highlands	0.7	3696	207.0	6	1	0	0	1	1	3	medium
4651C3	BLACK MTN SPUR	06010203010060	2	Highlands	0.5	2640	0.0	0	0	0	0	0	0	0	low
4651C4	SHEEP MTN	06010203010060	2	Highlands	1.5	7920	237.2	3	1	0	0	0	0	1	medium
4651D	MELTON PLACE ROAD	06010203010060	2	Highlands	0.3	1584	384.1	24	1	1	1	1	1	4	medium

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4663A	HERRIN KNOB	06010203010010	2	Highlands	4.0	21120	427.4	2	1	1	1	1	1	4	medium
4663B	DILLS FALLS	06010203010010	2	Highlands	0.6	3168	103.6	3	1	1	1	1	1	4	medium
4666A	HUNT CABIN	06010203010060	2	Highlands	0.4	2112	0.0	0	0	0	0	0	0	0	low
4669A	ROUGH BUTT CONNECTOR	06010203010060	2	Highlands	0.4	2112	0.0	0	0	0	0	0	0	0	low
4672A	LAUREL FALLS SPUR	06010203010020	2	Highlands	0.3	1584	0.0	0	0	0	0	0	0	0	low
4674A	HOGBACK SPUR A	06010203010010		Highlands	0.2	1056	1029.7	98	2	2	1	1	0	4	medium
467A	RICH MTN LOOK-OUT	06010105130040	1	Appalachian - FB	1.6	8448	0.0	0	0	0	0	0	0	0	low
472A	BUSICK	06010108020010	1	Appalachian - TOE	0.2	1061	0.0	0	0	0	0	0	0	0	low
472F	BLACK MTN	06010108020010	1	Appalachian - TOE	0.6	2957	369.9	13	1	0	0	1	1	3	medium
475B	HEADWATER	06010105010070	2	Pisgah	7.0	36960	3926.6	11	1	7	2	1	1	5	high
479A	HEADQUARTERS	06010105050010	2	Pisgah	0.4	2112	48.1	2	1	0	0	0	0	1	medium
481A	HARDTIMES LOOP	06010105050010	2	Pisgah	1.9	10032	0.0	0	0	0	0	0	0	0	low
481B	UPPER HARDTIMES LOOP	06010105050010	2	Pisgah	0.7	3432	0.0	0	0	0	0	0	0	0	low
481C	LAKESIDE LOOP	06010105050010	2	Pisgah	0.3	1742	0.0	0	0	0	0	0	0	0	low
481D	BIG JOHN LOOP	06010105050010	2	Pisgah	0.4	1848	0.0	0	0	0	0	0	0	0	low
481E	BENT CR LOOP	06010105050010	2	Pisgah	0.3	1320	0.0	0	0	0	0	0	0	0	low
481F	LAKE POWHATAN	06010105050010	2	Pisgah	0.1	528	0.0	0	0	0	0	0	0	0	low
481G	DUMP STATION	06010105050010	2	Pisgah	0.1	634	440.2	69	2	2	1	1	0	4	medium

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482A	NEWBERRY CREEK	03050101010020	0	Grandfather	2.9	15312	4412.8	29	2	3	1	1	1	5	high
520A	CABLE COVE R.A.	06010202070020	1	Cheoah	0.5	2439	927.9	38	2	2	1	0	0	3	medium
520B	POWELL BR.	06010202070020	1	Cheoah	0.2	1082	1615.7	149	2	7	2	0	0	4	medium
521B	TSALI R.A.	06010202070010	2	Cheoah	0.7	3643	246.2	7	1	0	0	0	0	1	medium
5500A	HUNT CAMP RD	06010108080040	1	Appalachian - TOE	0.2	1056	181.1	17	1	1	1	1	0	3	medium
5504A	PATE CREEK WEST	06010108100010	1	Appalachian - TOE	0.8	3960	0.0	0	0	0	0	0	0	0	low
57A	MILLER CEMETARY	06010202030010	2	Highlands	0.9	4752	0.0	0	0	0	0	0	0	0	low
57B	CLIFFSIDE PARKING	06010202030010	2	Highlands	0.2	1056	0.0	0	0	0	0	0	0	0	low
57C	CLIFFSIDE HOST SITE	06010202030010	2	Highlands	0.1	528	87.8	17	1	0	0	0	0	1	medium
6166A	TURNPIKE	06010202050020	2	Tusquitee	3.0	15840	0.0	0	0	0	0	0	0	0	low
61A	WAYAH OFFICE PARKING	06010202020030	2	Wayah	0.0	106	0.0	0	0	0	0	0	0	0	low
61B	WAYAH WORK CENTER	06010202020030	2	Wayah	0.0	106	0.0	0	0	0	0	0	0	0	low
6230B	EAGLES NEST	06020002050020	2	Tusquitee	0.9	4752	126.4	3	1	1	1	1	0	3	medium
650A	CEMETARY	06020002180010	1	Tusquitee	0.1	528	0.0	0	0	0	0	0	0	0	low
651A	LITTLE DAM	06020002180010	1	Tusquitee	0.1	528	58.2	11	1	0	0	0	0	1	medium
652A	LOOP A	06020002110010	2	Tusquitee	0.2	1056	913.3	86	2	2	1	0	0	3	medium
652B	LOOP B	06020002110010	2	Tusquitee	0.2	1056	0.0	0	0	2	1	0	0	1	medium
652C	LOOP C	06020002110010	2	Tusquitee	0.4	1848	0.0	0	0	2	1	0	0	1	medium

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652D	LOOP D	06020002110010	2	Tusquitee	0.7	3432	436.2	13	1	0	0	0	0	1	medium
652E	OLD BOAT RAMP	06020002110010	2	Tusquitee	0.1	528	395.3	75	2	1	1	0	0	3	medium
652F	RAMSEY BLUFF	06020002110010	2	Tusquitee	1.3	6864	159.1	2	1	2	1	0	0	2	medium
653A	KILLIAN BR	06020002110010	2	Tusquitee	0.5	2640	1519.8	58	2	0	0	1	0	3	medium
653B	LAKESIDE	06020002110010	2	Tusquitee	0.2	1056	0.0	0	0	0	0	0	0	0	low
67B	LONG BRANCH	06010202050010	2	Wayah	0.2	1056	1747.8	166	2	2	1	1	0	4	medium
69B	WINE SPRING BALD	06010202050010	2	Wayah	0.9	4752	0.0	0	0	0	0	0	0	0	low
711B	DIRTY JOHN SHOOTING RG	06010202050010	2	Wayah	0.3	1684	0.0	0	0	0	0	0	0	0	low
711G	WINE SPRINGS HORSE CAMP	06010202050010	2	Wayah	0.4	2112	0.0	0	0	0	0	1	0	1	medium
7280Z	WAYAH CREST	06010202050010	2	Wayah	0.1	264	0.0	0	0	0	0	0	0	0	low
79C	EAST PRONG OVERFLOW	03060102010020	2	Highlands	0.6	3168	2245.5	71	2	1	1	1	1	5	high
803A	SYCAMORE LOOP	06010105010070	2	Pisgah	0.1	739	0.0	0	0	0	0	0	0	0	low
803B	WHITE OAK LOOP	06010105010070	2	Pisgah	0.4	1848	0.0	0	0	0	0	0	0	0	low
803C	APPLE TREE LOOP	06010105010070	2	Pisgah	0.3	1584	431.4	27	2	1	1	1	0	4	medium
803D	DOGWOOD LOOP	06010105010070	2	Pisgah	0.3	1320	43.9	3	1	0	0	0	0	1	medium
803DS	DUMP STA	06010105010070	2	Pisgah	0.1	264	0.0	0	0	0	0	0	0	0	low
803E	LAUREL LOOP	06010105010070	2	Pisgah	0.3	1584	619.4	39	2	1	1	1	0	4	medium
803F	POPLAR LOOP	06010105010070	2	Pisgah	0.3	1320	0.0	0	0	0	0	0	0	0	low

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803G	HEMLOCK LOOP	06010105010070	2	Pisgah	0.3	1320	0.0	0	0	0	0	0	0	0	low
805A	ROCKY BLUFF EXT.	06010105120030	2	Appalachian - FB	0.1	528	0.0	0	0	0	0	0	0	0	low
81C	WHIGG BRANCH	06010204020040	2	Cheoah	1.7	8976	1728.0	19	1	5	2	1	0	4	medium
81F	WOLF LAUREL	06010204020040	2	Cheoah	4.7	24605	3713.1	15	1	7	2	1	1	5	high
81G	SWAN MEADOWS	06010204020040	2	Cheoah	1.0	5280	733.0	14	1	2	1	1	1	4	medium
81I	SWAN CABIN	06010204020040	2	Cheoah	0.4	2112	83.3	4	1	1	1	1	0	3	medium
81J	STEWART CABIN	06010204020040	2	Cheoah	0.1	528	34.3	6	1	0	0	0	0	1	medium
83D	DYKE GAP		2	Wayah	2.5	13200	4119.1	31	2	9	2	1	1	6	high
85A	PANTHER GAP	06020002170020	1	Tusquitee	4.6	24077	3264.0	14	1	2	1	0	0	2	medium
85A1	LIGHTNING RIDGE	06020002170020	1	Tusquitee	0.7	3696	103.4	3	1	1	1	1	0	3	medium

Appendix D – Road Management Guidelines

Road Management Guidelines

- If a road's maintenance condition has decreased, consider the need for the road and the historic use, as well as alternative roads in the area before permanently changing the maintenance level.
- Reduce the maintenance level on identified low value level 3, 4, and 5 roads being analyzed in sub-forest scale roads analyses. This can be a cost effective alternative. Reduced maintenance, with the primary focus being on road drainage, should not result in any increased watershed risks. The reduced maintenance should only result in reduced user comfort, and hence, reduced use over time will further reduce the potential for road related watershed risks.
- It is important for travelers to have the sort of information necessary to make a decision about the road on which they're about to travel. When appropriate, utilize entrance treatments, warning signs, route markers, and information bulletin boards to advise travelers of conditions ahead.
- Do not post speed limit and other regulatory signs on roads under Forest Service jurisdiction without a Forest Supervisor's order and a law enforcement plan
- To reduce annual maintenance costs, implement seasonal travel restrictions on roads susceptible to damage during wet or thawing conditions.
- Collect road maintenance and surface rock replacement deposits as appropriate on all road use permits and special use permits.

Capital Improvement Guidelines

<u>Discussion</u>

This analysis does show there is a need to reconstruct existing roads to correct deferred maintenance work items or to improve some roads to meet the increasing use and traffic requirements. Funding limitations require prioritization of reconstruction work. The Road Risk-Value Graph provides a starting point for developing priorities. The following guidelines are to be used in conjunction with the graph when selecting, prioritizing and implementing road reconstruction and construction projects.

Guidelines

- Conduct road location reviews prior to all new construction and road relocations. Assure the location meets public and agency needs while mitigating environmental impacts identified in the analysis. Responsible line officers and resource and engineering specialists should participate in the review.
- Establish a traffic counting program to identify high use roads and traffic patterns.
- Roads with seasonal average daily traffic volumes exceeding 400 vehicles per day should be considered for reconstruction to two lanes.
- Use motor vehicle accident safety investigations and reports to help identify road safety hazards.

- Use the following categories to prioritize road investments planned to reduce deferred maintenance backlog on roads: 1 – Critical Health and Safety; 2 – Critical Resource Protection; 3 – Critical Forest Mission. Data for these work items can be found in the Infrastructure database.
- Coordinate reconstruction and construction work with other agencies whenever possible. Utilize interagency agreements to develop investment and maintenance partnerships.

Decommissioning Guidelines

Discussion

Road decommissioning results in the removal of a road from the road system. The impacts of the road on the environment are eliminated or reduced to an acceptable level. To accomplish this, a number of techniques can be used, such as posting the road closed and installing waterbars, posting and installing barriers and barricades, ripping and seeding, converting the road to a trail, and full reclamation by restoring the original topography. There is a different cost associated with each of these techniques and their effectiveness for deterring unauthorized motorized vehicle use varies as well. Decommissioning level 1 and 2 roads can consist of removing the few culverts, ripping and seeding, posting closed with signs, and installing waterbars to discourage unauthorized motorized vehicle use and ensure proper drainage occurs over time. Decommissioning level 3, 4, and 5 roads is more expensive than decommissioning most level 1 and 2 roads. When choosing a technique for road decommissioning, the objective is to eliminate the need for future road maintenance.

Level 3, 4 and 5 roads are usually wider than level 1 and 2 roads, have culverts installed at designed intervals to cross drain the road, are ditched, have better sight distances designed on horizontal and vertical curve, have larger cuts and fills, and are designed through the topography rather than with the topography. It is much more expensive to decommission these roads than level 1 and 2 roads. Given the cost, it may be cheaper to maintain level 3, 4, and 5 roads than to decommission them. However, future maintenance costs may not be the only factor to consider; other resource considerations may outweigh the cost. For a particular road (level 3, 4, or 5), those with a high deferred maintenance costs may exceed the costs of decommissioning.

Guidelines:

- Balance cost with resource risk and effectiveness of the treatment when selecting methods for decommissioning roads.
- Convert roads to trails as a decommissioning method when analysis of recreation demand indicates a need to expand, connect or improve the existing trail system in the area. Provide adequate trailhead parking as part of this treatment method (See UR1 and RR1 discussion in Chapter 4).
- Decommission by restoring the road to original contours when the Forest Plan requires mitigating visual impacts or when necessary to assure the elimination of vehicular traffic.

General Guidelines

The following are general road related guidelines:

- Require authorized, permitted operations utilizing NFS roads to pay their fair share of road maintenance costs.
- Consider road decommissioning when planning projects that involve the construction and use of short term, single resource roads: for example, roads planned for mineral projects that undergo exploration, development, and abandonment phases. By incorporating decisions to decommission the single resource roads at the end of the project, rather than not addressing this issue up front, the Forest will better demonstrate a commitment to managing its road system toward the minimum road system needed. Document planned decommissioning in road management objectives.
- Develop an annual maintenance plan to prevent deferred maintenance costs from accruing on High Value rated roads
- Update the road system databases and keep them current.
- Use an interdisciplinary process to develop, update, and implement road management objectives for all system roads. Assure that information in the transportation atlas and inventory conforms with approved road management objectives.
- At appropriate intervals, update the data contained in the Road Matrix. Analyze the changes to determine new opportunities that may have developed as new information is collected.
- Incorporate yearly Forest road changes into the annual Forest Plan Monitoring Report (via the forest plan revision process). These road changes can include miles of roads decommissioned (classified and unclassified), miles of roads converted to trail (MV and Non-MV), miles roads reconstructed (by maintenance level), and miles of roads constructed (also by maintenance level).
- At least once every 2 years, perform road condition surveys on all level 3, 4, and 5 roads.

APPENDIX E - Nantahala and Pisgah Roads Analysis Public/Agency/Cooperator Written Comments

Road #	Road Name	Uses	Comment1	Comment2	Comment3	Comment4
	Frederick Law Olmsted Way	arboretum access	keep open			
	Service Road	arboretum admin	keep open			
	All others in Arboretum boundary		close			
?	Old Highway 70	Mountain Biking	Look good as is	Do not widen or pave		
3512	Mill Creek Road	Mountain Biking	Look good as is	Do not widen or pave		
482	Curtis Creek Road	Mountain Biking	Look good as is	Do not widen or pave		
5543	Upper Creek	Mountain Biking	Look good as is			
472	South Toe	Mountain Biking	Look good as is			
2074	Neals Creek	Mountain Biking	Look good as is			
SR 1238	Old Highway 105	Mountain Biking	Look good as is	Do not widen or pave		
210	Roses Creek Road	Mountain Biking	Look good as is			
496	Gingercake Road	Mountain Biking	Look good as is	Do not widen or pave		
467A	Rich Mountain	Mountain Biking	Look good as is	Do not widen or pave	Very Scenic	Have seen wildlife
?	Paint Fork	Mountain Biking	Look good as is	Do not widen or pave	Very Scenic	Have seen wildlife
SR 1328	Wilson Creek	Access private	Several dangerous, eroded spots near where there is a blind curve	Traffic will increase, causing road to become more dangerous		
470	Little Buck		Shoulders need repair	Dangerous if 2 cars met		
4049	Lime Kiln		Glad it's closed	Don't open past 2nd gate at any time		
1327	Evans Road Continuation	Access private, hiking, biking,camping	Timber harvest has deleterious effect on scenery. Shoud provide buffer.	Timber harvest adversely affects water quality. Shuler Creek runs turbid after rain.	Heavily littered	[Other comments regarding timber, pine beetles, not related to roads]
340	Fires Creek	hiking, trail maintenance	Improvements or maintenance needed to make road less punishing to vehicles	Four trailheads are accessed off last and worst section of road	Improvement will improve access for hunters and fishermen as well as hikers	

APPENDIX E - Nantahala and Pisgah Roads Analysis Public/Agency/Cooperator Written Comments

427	Big Stamp	hiking trail maintenance	No longer safely passable by 4-wheel drive - needs improvement	Provides only access to Rim Trail except at Leatherwood Falls	Improvement will improve access for hunters as well as hikers	
1307	Tusquitee Gap	hiking trail maintenance	Very rough and rocky. Passable only by 4-wheel high clearance vehicle	Provides only access to a section of Chunky Gal Trail	Improvement will improve access for hunters as well as hikers	
			We prefer roads not to be improved according to NC DOT standards.	The excessive widening and paving of roads will encourage higher speed traffic and increaced RV usage.	Roads should be paved as they lie, or specific "bad" spots repaired.	
			Road density throughout forest is excessive.	Dennsity should be below 1 mi/sq. mi. for terrestrial and aquatic habitat	Closed roads and LWOs are not the same as no roads	An EIS must be prepared covering all roads
475	Davidson River	access for hiking	very rough, rarely regraded,	seems to be abandoned by USFS		
475B	Headwater	access for hiking				
1206	Yellow Gap	access for hiking				
479	Wash Creek	access for hiking				
477C	Bennett Gap	access for hiking				
297	Turkey Pen Gap	access for hiking				
229	Deep Gap	access for hiking				
476	Gaging Station	access for hiking				
475-C	Horse Cove	access for hiking				
5044	Bennett Knob	access for hiking				
5095	Baldwin Branch	access for hiking				
5058	Clawhmmer	access for hiking				
5097	Fletcher Creek	access for hiking				
5001	Seniard Mountain	access for hiking				
			When will new Highway 25 be built? It is needed			

			USFS does an excellent job of managing the Pisgah Ranger District despite often irritating screaming from all sides	I see no justification for continued construction of new, high quality roads which are far in excess of access required for logging.		
?	?	access for hiking and trail maintenance	closed road between FS gate and AT "Barn" shelter near Yellow Mtn. Gap in Avery County, NC	this road condition is currently quite good - noticeable better that in earlier years.		
5000	Wash Creek	access for leading hikes	should be routinely maintained in order that the public can have access to the hiking trails	this road provides access to a number of trailheads.		
	Roads giving access to hiking trails		maintain these roads so that hikiers can drive to trailheads without damage to their vehicles			
			Please minimize roads in the national forest			
81	Santeelah Creek	access to property @ Swan Meadows	road in good shape, good job			
81F	Wolf Laurel	access to property @ Swan Meadows	road in good shape, good job			
81I	Road to Swan Meadow that is above the Wolf Laurel Road		should be closed			
			Many roads that should be closed			
340	Fires Creek	hiking				
424	Standing Indian	hiking				
81F	Wolf Laurel	hiking				
81	Santeelah Creek	hiking				
69	Wayah Bald					
420	Davis Creek		need better control of ORVs in Tellico, they are causing too much damage when they leave designated ORV trails			

?	Road to Whigg Meadow off Tellico River Road					
479	Bent Creek	hiking	road maintenance satisfactory			
294	North Mills River	hiking	road maintenance satisfactory			
297	Turkey Pen Gap	hiking	road maintenance satisfactory			
475	Davidson River	hiking	road maintenance satisfactory			
TN?	Roaring Creek	hiking access, maintain AT	road OK			
TN?	Greasy Creek	hiking access, maintain AT	road OK			
TN?230	Beauty Spot	hiking access, maintain AT	road OK	FAVORITE ROAD	access to two ends of the AT	
TN?	USFS Road south from Indian Grove Gap	hiking access, maintain AT	road OK			
NA			1) Adopt the Roadless Area Conservation Rule on the Nantahala,			
			regardless of what is done on the national level.			
			2) Include "unroaded" but "unmapped" areas in the roadless rule.			
			3) Make it FS policy that no Forest Service road will be built anew or			
			kept in the FS road system or "upgraded" unless the financing needed to			
			maintain them is identified.			
			4) Make it FS policy that no new road (permanent or temporary) will be			

			built for any reason unless other, unneeded roads are decommissioned and fully obliterated on a 1:5 basis (i.e., obliterate five miles of road for every one mile of new construction.) This should be done at least within the same ranger district. The ratio could be increased, too, depending on how fast the Forest Service actually wants to try to bring its roads mess under control.			
			5) Make it FS policy that any new road (temporary or permanent)			
			constructed for a single, private purpose (timber sales, mining sites,			
			access to private inholding, etc.) shall be done entirely at the private users' cost.			
			6) Fully study the benefits (and possible drawbacks) of carving out a			
			new forest for the Chattooga Watershed. (This recommendation is			
			occasioned by the massive road work done under the name of the Large			
			Scale Chattooga Watershed "Restoration" Project in the Nantahala,			
			Chattahoochee and Sumter Forests over the past three years ? and I can			
			give you a lot more details about this separately if you want.)			
			7) Increase the use of temporary road closures (i.e., after bear and			
			deer season, before turkey season) in wet winter months to help reduce			
			erosion and road degradation.			
			8) Make all contract road work done for the Forest Service subject to			
			open, competitive bidding, with the lowest qualified bidders taking the			
			work.			

			9) Enunciate understandable, science-based criteria for all road			
			management on this forest and closely monitor road developments in out			
			years. Complete better maps of all Forest Service roads, down to the			
			quad-map level.			
			10) Make it part of the overall road plan that the Forest Service is provided sufficient law enforcement personnel to monitor wrongdoing on and emanating from Forest Service roads.			
			11) Subject all roadwork done on Forest Service roads, including			
			so-called "heavy maintenance," to NEPA analysis.			
			12) Change federal law and practice so that any ORV used illegally on			
			national forests is subject to permanent confiscation.			
45,651,178	Glade Road/Bull Pen Road	nearby landowner	1) Seasonally lock the gate at the intersection of Glade and Bull Pen			
			Roads once the Glade Road decommissioning is complete (Glade is being			
			turned into a trail.)			
67 and others	upper Nantahala		2) Continue other, existing seasonal closures in the Wayah (notably FS			
			67) and Highlands districts.			
		nearby landowner	3) Do not pave any more FS roads in the Chattooga Watershed until the			
			long-term effects of such new paving is understood and analyzed (from			
			both erosion and safety points of view.)			
1178 & ?	Bull Pen & Whiteside Cove		4) Make it policy that the Forest Service is not in the business of			
			providing commuter road corridors from one locale to another (Bull Pen			

			and Whiteside Cove Roads.)			
?	?		5) Obliterate the old road that goes up to the old observation post at			
			the top of Yellow Mountain (where you are getting some illegal ATV, and			
			possibly 4-wheel, traffic.)			
?	?		6) Conduct a specific and separate study of road access into Panthertown Valley and move to close those roads and trails used for illegal ORV traffic. Work with Duke Power to better block legal rights-of-way to the powerline that are used for illegal and unwanted ORV access (so far, only motorcycles and ATVs.)			
?	?		7) Turn the main trail to top of Whiteside Mountain back into a hiking			
			trail. (Erosion control and emergency access work done on that trail			
			several years apparently mistakenly brought it up very close to road			
			standards.)			
?	Rich Gap Road	nearby landowner	Beyond Highlands landfill,gate road to control access	restrict winter traffic to emergencies to reduce erosion	significant erosion from the road onto private property	
471	Cathey Creek	hunting	Too much horseback riding on roads	Hikers and bike riders should have to wear blaze orange during hunting season just like the hunters do.	Roads are narrow and bike riders won't give you the right-of-way to get by on the road	
477C	White Pine	hunting	Too much horseback riding on roads	Hikers and bike riders should have to wear blaze orange during hunting season just like the hunters do.	Roads are narrow and bike riders won't give you the right-of-way to get by on the road	
297	Turkey Pen	hiking, biking, scenery	trash - need bottle bill			
1206	Yellow Gap	ditto	trash - need bottle bill			
477	Avery Creek	ditto	trash - need bottle bill			

477C	White Pine	ditto	trash - need bottle bill			
475	Davidson River	washboardin, caving in, poor design	parking on grass instead of pulloffs			
NA	NA	No New Roadbuilding	Pub boulders to prevent parking on grass	Don't pave gravel roads - will increase use		
475	Davidson River	trailhead access to recreate - hike, mountain bike, trail-run, rock climb, ice climb	roadside trash from roadside camping	Current leve of maintenance is fine. Higher level ofmaintenance encourages higher speed of cars which is a conflict for recreating	Major trailheads along side roads could benefit from outhouse facilities	do not pave and turn into highway 50. This will ruin recreation aspect of this road and cause a significant safety hazard.
471	Cathey Creek	ditto	roadside trash from roadside camping	Current leve of maintenance is fine. Higher level ofmaintenance encourages higher speed of cars which is a conflict for recreating	Major trailheads along side roads could benefit from outhouse facilities	
477	Avery Creek	ditto	roadside trash from roadside camping	Current leve of maintenance is fine. Higher level ofmaintenance encourages higher speed of cars which is a conflict for recreating	Major trailheads along side roads could benefit from outhouse facilities	
5000	Wash Creek	ditto	roadside trash from roadside camping	Current leve of maintenance is fine. Higher level ofmaintenance encourages higher speed of cars which is a conflict for recreating	Major trailheads along side roads could benefit from outhouse facilities	

475b	Headwater	ditto	roadside trash from roadside camping	Current leve of maintenance is fine. Higher level ofmaintenance encourages higher speed of cars which is a conflict for recreating	Major trailheads along side roads could benefit from outhouse facilities	
5055	Slate Rock	ditto	roadside trash from roadside camping	Current leve of maintenance is fine. Higher level ofmaintenance encourages higher speed of cars which is a conflict for recreating	Major trailheads along side roads could benefit from outhouse facilities	
479	Bent Creek	ditto	roadside trash from roadside camping	Current leve of maintenance is fine. Higher level ofmaintenance encourages higher speed of cars which is a conflict for recreating	Major trailheads along side roads could benefit from outhouse facilities	
475/hwy 50	Davidson River	close central section of this road and revegetate it	concern it will become a thorooughfare linking Balsam Grove to Pisgah Forest, further fragmenting and urbanizing the forest.	If road is improved the use will intensify		
NA		Close as many forest roads as possible				
477	Avery Creek	hiking, biking, hunting, camping	Have not encountered problem with the roads or helped anyone that had a problem.	Against paving more forest roads		
471	Cathey Creek	hiking, biking, hunting, camping				
475	Davidson River	hiking, biking, hunting, camping				
475d	McCall Cemetary	hiking, biking, hunting, camping				
475b	Headwater	hiking, biking, hunting, camping				

5041	Case Camp Ridge	hiking, biking, hunting, camping				
5000	Wash Creek	hiking, biking, hunting, camping				
1206	Yellow Gap Road	hiking, biking, hunting, camping				
477	Avery Creek	camping	better camping areas with restrooms and water would be money well spent	Restrooms at the parking lot right at the parkway would be great.		
5000	Roads off 276 leading to the Blue Ridge Parkway	botanical observation, view scenery, education,protection	Dirt roads should be maintained to prevent serious problems with erosiona, overgrown vegetation, etc.	Roads should not be "improved" as to invite damage by off-road vehicles.	Care should be given when improving roads as to not damage or disturb sensitive environments such as wetlands, bogs, rare and endangered plants, etc.	
			All roads should be maintained so that firefighting equipment can get as close to the fires as possible	Roadside vegetation should be managed so that invasive vegetation in not encouraged to perpetuate and become serious problems.		
257	Sycamore Flats		Many, Many people use this road for walking. Traffic is heavy and walkers have to move off the pavement.	Make a parking lot at entrance and not allow cars at certain times, or else widen road to walkers don't have to dodge cars.		
474	Bridge to English Chapel		Bridge in need of repair or replacement			
	NA		Close all roads that are not absolutely necessary	Build no new roads	Spend more dollars on maintenance and trails.	
	NA	hiking, backpacking, mountain biking, fishing, hunting	Do not add any new roads	Do not close any existing roads	Make the one-way roads in GSMNP into two-lane roads	
482	Curtis Creek Road	trout fishing	Road in very good condition			

APPENDIX E - Nantahala and Pisgah Roads Analysis Public/Agency/Cooperator Written Comments

294	North Mills River	fishing	several soft spots with thin gravel	several places where shoulder is higher than road and water stands	for the most part road is very usable for a passenger car.	
5511	Seven Mile Ridge		Washout at Culvert below Victor Place	Need road runoff control on road further north		
438	Wauchecha	special use permit - radio towers	Needs gravel			
423B	Joanna Bald	rain guage	Usually in good shape			
?	Sweetwater Gap	rain gauge	Usually in good shape			
?	Chestnut Flats	rain guage	Usually in good shape			
259	Nolten Ridge Road	Access to Cheoah Bald and AT	Usually in good shape			
81F	Wolf Laurel		hiking, biking, education, access to AT for maintenance work, scenery	District doing a good job managing roads		
81	Santeelah Creek		hiking, biking, education, access to AT for maintenance work, scenery	District doing a good job managing roads		
?	Road from Yellow Gap toward Wauchecha		hiking, biking, education, access to AT for maintenance work, scenery	District doing a good job managing roads		
2608	Green Gap		hiking, biking, education, access to AT for maintenance work, scenery	District doing a good job managing roads		
259	Nolton Ridge		hiking, biking, education, access to AT for maintenance work, scenery	District doing a good job managing roads		
75	Big Snowbird		hiking, biking, education, access to AT for maintenance work, scenery	District doing a good job managing roads		
	NA		More law enforcement for 4-wheelers on closed roads			
1206	Yellow Gap	hiking - park at trailheads	Road seems well kept			
470	Little Buck		Places where the shoulders need repair (they are broken off) and it would be dangerous if 2 cars met.			
4049	Lime KIln		Glad it's closed. Don't open road past second gate at any time.			

469	Armstrong	hiking, hunting				
469A	Falls Branch	hiking, hunting				
1073	Toms Creek	hiking, hunting				
104	Betsy Ridge	hiking, hunting				
			Like to see timber sale units because there is dying and diseased trees. This has also been beneficial to the wildlife and to the health of the forest. Would like to see more done where appropriate	SPB - damage on roads & trails - disasterous		
99	Table Rock	favorite road	destruction/safety would like to see this cleaned up - not safe for tourists			
			Apprecieate meeting - good to meet the new folks on the district - learn common goals			
367	Blue Valley	access waterfalls	continue mainenance			
301	Blue Valley	access waterfalls	continue mainenance			
77	Blue Valley	access waterfalls	continue mainenance			
79	Blue Valley	access Waaganan amethyst mine	continue mainenance			
4567	Rich Gap Road	access secret falls	continue mainenance to walkingstick road			
	Bull Pen Road	access to Hawkins Rock House, Mary Berry amethyst mine, Ellicott Rock	continue mainenance			
	Glade Road	access to Hawkins Rock House	continue mainenance from Bull Pen Road to Forest Service gate			

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