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# Nantahala and Pisgah National Forests



## Final Land Management Plan

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# Land Management Plan

## Nantahala and Pisgah National Forests

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## The Final Plan

This document describes the 2021 revised forest plan (“plan”), which comprises the changes to the 1994 forest plan. The purpose of the plan is to have an integrated set of direction to provide for ecological sustainability and social, economic, and other multiple uses of the lands and resources of the Nantahala and Pisgah National Forests (the Forests). The plan provides guidance for project and activity-level decision making on the Forests for approximately the next 15 years. The final plan describes desired ecological, social, and economic conditions of the Forests and provides plan component direction that focuses management activities toward maintaining or achieving those conditions over time. Plan components are designed to provide for the maintenance and restoration (where needed) of the ecological integrity of terrestrial and aquatic ecosystems and watersheds, to guide the Forests’ contribution to social and economic sustainability, and to meet the Forest Service’s responsibility to Native American tribes in relation to trust responsibilities and treaty resources. There is a single revised plan for the Nantahala and Pisgah National Forests. The associated Environmental Impact Statement examines the potential ecological and biological impacts, as well as the economic and social impacts, to the local counties, the broader regional level, and the nation.

## The Purpose of the Forest Plan

The forest plan guides the Nantahala and Pisgah National Forests in fulfilling its stewardship responsibilities to best meet the current and future needs of the American people. This plan provides forest-specific guidance and information for project and activity decision making over the plan period, generally considered to be 10-15 years. It provides the vision, strategy, and constraints that guide integrated resource management, provide for ecological sustainability, and contribute to social and economic sustainability on the Forests and the broader landscape. The forest plan does not compel any Agency action or guarantee specific outcomes. It does not prioritize projects or activities. Priorities, or the focus of forest management, fit within the framework set forth in the forest plan and are developed and reassessed continually by forest leadership in collaboration with the public. Within the constraints of this forest plan, management adapts to achieve the vision that the forest plan lays out. Decision making is informed by feedback from monitoring that actively tests assumptions, tracks relevant conditions over time, and measures management effectiveness.

The 1976 National Forest Management Act (NFMA) directs that forest plans be revised on a 10-to-15-year cycle. The regional forester signed the original Nantahala and Pisgah National Forests Plan in 1987 and a significant forest plan amendment in 1994. Since that time, the forest plan has been amended 26 times. Scientific information, circumstances, agency, and public understanding, as well as economic, social, and ecological conditions, have changed over the past 30 years, and, as a result, management emphasis has shifted from outputs to outcomes. Forest plans are one of three levels of planning and decision-making that guide how National Forest System (NFS) lands are managed.

The first and broadest level of planning occurs at the national level through the United States Department of Agriculture Forest Service Strategic Plan, a five-year plan that allows public transparency of the agency’s goals, objectives, and accomplishments. The second level of planning occurs at the level of National Forest System administrative units through forest plans. Forest plans are strategic in nature, making general decisions that are often referred to as programmatic decisions. That is, they provide the framework for integrated resource management and guidance for subsequent project and activity decision making for the Forests. The third level of planning includes development of on-the-ground projects and activities that are designed to achieve the desired conditions and objectives of the forest plan. Projects and activities must be consistent with the forest plan. It is important to note that this forest plan does not create, execute, or authorize site-specific

activities, rather it establishes broad direction similar to zoning in a community. Project-specific analysis and decisions are still required to follow appropriate procedures. For example, site-specific project analysis required by the National Environmental Policy Act will be conducted in order to enact proposed activities on the ground, which will ensure compliance with the broader direction of the forest plan.

Many other laws and regulations apply to the management of National Forests, including Executive orders, the Code of Federal Regulations (CFRs) and the Forest Service directive system, which consists of the Forest Service Manual (FSM) and the Forest Service Handbook (FSH). Furthermore, other types of plans, such as trail management plans, comprehensive river management plans and the Cradle of Forestry Management Plan, contain additional management direction. This direction does not need to be restated in the forest plan and still applies.

A forest plan guides and constrains Forest Service personnel, not the public. Any constraint on the public needs to be imposed by law, regulation, or through the issuance of an order by the responsible official under 36 CFR part 261, Subpart B. In addition to forest plans, management of NFS lands is also guided and constrained by laws, regulations, policies, practices, and procedures that are in the Forest Service Directive System. These are generally not repeated in forest plans. This forest plan is the result of a revision process conducted in accordance with the 2012 Planning Rule (36 CFR 219) and its 2015 planning directives (FSH 1909.12).

## **Nature of the Decisions Made in a Forest Plan**

In May 2012, the United States Forest Service began using new planning regulations (“2012 Planning Rule”) to guide collaborative and science-based revision of forest plans that promote the ecological integrity of National Forests while considering social and economic sustainability. The 2012 Planning Rule specifies the following primary decisions to be made in forest plans:

1. Forestwide components to provide for integrated social, economic, and ecological sustainability and ecosystem integrity and diversity while providing for ecosystem services and multiple uses. Components must be within Forest Service authority and consistent with the inherent capability of the plan area (36 Code of Federal Regulations (CFR) 219.7 and CFR 219.8–219.10).
2. Recommendations to Congress (if any) for lands suitable for inclusion in the National Wilderness Preservation System and/or rivers eligible for inclusion in the National Wild and Scenic Rivers System (36 CFR 219.7(2)(v) and (vi)).
3. The plan area’s distinctive roles and contributions within the broader landscape.
4. Identification or recommendation (if any) of other designated areas (36 CFR 219.7 (c)(2)(vii)).
5. Identification of suitability of areas for the appropriate integration of resource management and uses, including lands suited and not suited for timber production (36 CFR 219.7(c)(2)(vii) and 219.11).
6. Identification of the maximum quantity of timber that may be removed from the plan area (36 CFR 219.7 and 219.11 (d)(6)).
7. Identification of geographic area or management area specific components (36 CFR 219.7 (c)(3)(d)).
8. Identification of watersheds that are a priority for maintenance or restoration (36 CFR 219.7 (c)(3)(e)(3)(f)).
9. Plan monitoring program (36 CFR 219.7 (c)(2)(x) and 219.12).

The best available scientific information (BASI) has been used to inform the planning process. The planning record documents how BASI was determined to be accurate, reliable, and relevant to issues being considered. The BASI includes relevant ecological, social, and economic scientific information. Use of BASI was documented for the assessment, the plan decision, and the monitoring program. The 2012 Planning Rule does not require that planning develop additional scientific information, but that planning should be based on scientific information that is already available. New studies or the development of new information is not required for planning unless required by other laws or regulation. In the context of the BASI, “available” means that the information currently exists in a form useful for the planning process without further data collection, modification, or validation. Analysis or interpretation of the BASI may be needed to place it in the appropriate context for planning.

Development of this revised plan was an iterative process utilizing best available scientific information, regional guidance, internal feedback, and collaboration with a wide variety of government agencies, federally recognized tribes, non-governmental organizations, and interested citizens.

The plan will not subject anyone to civil or criminal liability and will create no legal rights. The plan will not change existing permits and authorized uses.

### **The Role of Adaptive Planning and Monitoring**

Forest planning is a continuous process that includes (1) assessment; (2) plan development, amendment, and revision; and (3) monitoring. The intent of this forest planning framework is to create an integrated approach to the management of resources and uses, incorporate the landscape-scale context for management, allow the Forest Service to adapt to changing conditions and improve management based on monitoring and new information.

An adaptive forest plan recognizes that there is always uncertainty about the future of natural systems and the timing and type of disturbances. Social conditions and human values regarding the management of National Forests are also likely to change. Given that the setting for forest plan implementation will be changing over time, the forest plan incorporates an effective monitoring program capable of detecting change with an adaptive flexibility to respond to those detected changes. The forest plan monitoring program recognizes key management questions and identifies measurable indicators that can inform the questions. When conditions change beyond what was anticipated in the forest plan, a responsive process using narrow amendments can be used to adjust plans between revisions.

The planning framework creates a structure within which land managers and partners work together to understand what is happening on the land. It is intended to establish a flexible forest plan that allows the forest to adapt management to changing conditions and improve management based on new information and monitoring.

The forest plan monitoring phase comes after the forest plan has been revised. The monitoring phase includes:

- a. Designing management activities proposed to implement the plan in a way that will yield specific information and support learning.
- b. Analyzing monitoring results using scientific methods that reduce uncertainty and improve understanding of system behavior. Well-designed monitoring programs and management activities contribute to better scientific analysis of these results. Monitoring and analysis also evaluate progress to achieving desired conditions and objectives of the plan and the assumptions used in developing the plan.

- c. Learning from the results of the analysis and sharing how the results either confirm or modify the existing assumptions or provide feedback on management effectiveness. Learning is proactively shared with land managers and the public.
- d. Adapting planning and management activities based on learning from the results of the analysis. This adaptation takes the form of modifying assumptions, models, data, and understanding of the system. This knowledge is then used to inform the planning process that leads to adjustment of plans and projects.

## **The Parts of the Forest Plan**

The forest plan must include plan components. Plan components (plan decisions) guide future project and activity decision-making and include desired conditions, objectives, standards, guidelines, suitability of lands, and goals. Plan components should (1) provide a strategic and practical framework for managing the Forests, (2) be applicable to the resources and issues of the Forests, and (3) reflect the Forests' distinctive roles and contributions. As a whole, the set of plan components must provide for social, economic, and ecological sustainability and multiple uses.

There is an important distinction between plan components (desired conditions, objectives, standards, guidelines, goals, and suitability) and other language of the plan. Plan components in this document are indicated by a labeled coding system, explained below. A plan amendment is required to add, modify, or remove one or more plan components or to change how or where one or more components apply to all or part of the plan area (including management areas or geographic areas) (36 CFR 219.13(a)). Any substantive changes to plan components require a plan amendment with appropriate analysis as required under the National Environmental Policy Act (NEPA).

Other elements of the forest plan that are not plan components provide information and/or background material integral to the successful implementation of the forest plan. As conditions change, this information can be updated with administrative changes. Administrative changes can be used to make changes such as updates to data and maps, management approaches, and relevant background information; to fix typographical errors; or to update other required content of a plan (content that are not plan components). The public will be notified of all administrative changes to the forest plan.

## **Desired Conditions**

Desired conditions are the foundation of forest plan development. They describe the goals and outcomes of forest management and the ecological, social, and economic attributes that a forest can achieve over time. Desired conditions must be described in terms that are specific enough to allow progress toward their achievement to be determined but not include completion dates (36 CFR 219.7(e)(1)(i)).

Desired conditions guide the development of future projects and activities and establish a means for determining the consistency of projects with forest plans. They may apply to the entire plan area or to specific management areas. Desired conditions are not commitments or final decisions approving projects and activities. The desired condition for some resources may currently exist, while the desired condition for other resources may only be achievable over a long time period across multiple planning cycles. The Forests may need to make adjustments in the desired conditions if monitoring results indicate they are not achievable in the long term. Desired conditions are found throughout the plan under the heading "Desired Conditions."

## **Objectives**

An objective is a concise, measurable, and time-specific statement of a desired rate of progress toward a desired condition or conditions. Inclusion of objectives in the plan does not guarantee funding for these actions. Objectives should be based on reasonably foreseeable budgets (36 CFR 219.7(e)(1)(ii)). Objectives describe the focus of management in the plan area within the plan period; not every action that the Nantahala and Pisgah National Forests may take is included as an objective. Objectives are not intended to be a limit, and planned activities may be exceeded. Objectives that are defined as occurring “over the life of the plan” are referring to the first 15 years of plan implementation. Objectives are found throughout the plan under the heading “Objectives.”

This plan contains Tier 1 and Tier 2 objectives. Tier 1 objectives are based on a continuation of recent Forest Service budgets and capacity, while Tier 2 objectives reflect additional outcomes that may be possible with added capacity of partners and partner resources. Any individual objective may proceed to Tier 2 when additional capacity and resources are available for that action. Effects both tiers of objectives were analyzed in the EIS.

## **Standards**

A standard is a mandatory constraint on project and activity decision making established to help achieve or maintain the desired condition or conditions, to avoid or mitigate undesirable effects, or to meet applicable legal requirements (36 CFR 219.7(e)(1)(iii)).

Standards can be developed for forestwide application or for specific areas and may be applied to all management activities, or selected activities. Standards are found throughout the plan under the heading “Standards.”

## **Guidelines**

A guideline is a constraint on project or activity decision making that allows for departure from its terms so long as the purpose of the guideline is met. Guidelines are established to help achieve or maintain a desired condition or conditions, to avoid or mitigate undesirable effects, or to meet applicable legal requirements (36 CFR 219.7(e)(1)(iv)).

Guidelines can be developed for forestwide application or for specific areas and may be applied to all management activities or selected activities. Guidelines are found throughout the plan under the heading “Guidelines.”

## **Suitability**

Specific lands within the Forests will be identified as suitable for various multiple uses or activities based on the desired conditions applicable to those lands. The plan will also identify lands within the Forests as not suitable for uses that are not compatible with desired conditions for those lands. The suitability of lands need not be identified for every use or activity (36 CFR 219.7 (e)(1)(v)).

Identifying suitability of lands for a use in the forest plan indicates that the use may be appropriate but does not make a specific commitment to authorize that use. Final suitability determinations for specific authorizations occur at the project or activity level decision making process. Generally, the lands on the Forests are suitable for all uses and management activities appropriate for National Forests, such as outdoor recreation or timber, unless identified as not suitable.

## **Management Areas**

Management areas (MAs) are spatially identified areas within the Forests. These areas are assigned sets of plan components such as desired conditions, suitable uses, and, in some areas, either standards or guidelines, or both. Management areas are repeated across the landscape.

## **Geographic Areas**

Geographic areas describe specific areas of the Forests and the goals to accomplish forest objectives that are present in those areas of the Forests. Within each geographic area, land is allocated to different management areas, such as Interface, Matrix, and Backcountry, as well as specially designated areas. These management areas repeat across geographic areas much like residential, commercial, and industrial zones repeat across a city. Geographic areas themselves do not repeat but represent the unique identity of specific areas of the Forests.

### **How do geographic areas work with management areas?**

Geographic areas and management areas work together to identify where activities will occur on the landscape.

For example, management areas identify the types of locations across the forest where recreation will be emphasized, whether more accessible by road, such as Interface MA, or less accessible, in Backcountry MA.

Geographic area goals identify strategic recreation goals for particular locations. For example:

Pisgah Ledge goal: With increased visitation within the U.S. Highway 276 corridor, emphasize management actions that sustain and enhance high quality recreation experiences with a focus on visitor safety, improving access, and reducing impacts to natural resources.

Fontana Lake goal: Continue to work with marina and mooring point special use permit holders to modernize and improve water-based recreation.

In the same way, the forestwide resources topics depend on information from both management areas and geographic areas to identify where activities will occur.

## **Goals**

Goals are broad statements of intent, other than desired conditions, usually related to process or interaction with the public. Goals are expressed in broad, general terms but do not include completion dates. In this plan, goals that relate to the plan's four themes are expressed for each geographic area.

## **Other Required Plan Content**

In addition to the plan components described above, this plan contains other required content, including distinctive roles and contributions of the plan area, identification of priority watersheds, proposed and possible actions, and the monitoring program.

### **Distinctive Roles and Contributions of the Forest**

The Forests' distinctive roles and contributions within the broader landscape (in Chapter 1) provide an understanding of the ecological, social, and economic context that surrounds the plan area.

## **Priority Watersheds**

Watersheds of the Nantahala and Pisgah National Forests that are a priority for maintenance or restoration are contained in the Watershed section (Chapter 2). Changes as to which watersheds in the plan are “priority” are made by administrative change.

## **Proposed and Possible Future Actions**

The land management plan contains proposed and possible actions that may occur on the Forest during plan implementation. The objectives that are identified (shown throughout the plan and consolidated in Appendix A) are those proposed actions designed to advance resources toward desired conditions. Management approaches across the forestwide (Chapter 2) and management area chapters (Chapter 4), and the goals in the Geographic Area chapter (Chapter 3) are the possible actions that describe potential actions or strategies compatible with achieving desired conditions and objectives. Management approaches and geographic area goals also include program strategies, inventories, assessments, resource analyses, and ongoing work with partners and cooperating agencies anticipated during the life of the plan. Additionally, Appendix B describes the planned timber sale program, timber harvest levels and methods of forest vegetation management practices expected to be used. These proposed and possible future actions do not commit the Forest Service to perform or permit those actions, but they are provided as possible actions that would likely be consistent with plan components. These actions are not intended to be all-inclusive; the forest is not limited to these possible actions when proposing projects and activities.

## **Monitoring Program**

The plan monitoring program outlined in Chapter 5 identifies plan effectiveness monitoring questions and associated indicators. The monitoring program informs the management of resources on the plan area, including testing relevant changes and measuring management effectiveness and progress toward achieving or maintaining the plan’s desired conditions or objectives per 36 CFR 219.129(a)(2).

## **Maps**

Forest plan maps accompany this land management plan, including maps of geographic areas and maps of the Management Area (MA) allocations.

Viewing the MA allocation on a flat piece of paper (two-dimensional map) can be confusing where multiple MA prescriptions apply to the same piece of land. Lands with overlapping MA allocations are managed in accordance with all applicable MA plan direction and must comply with the most restrictive plan direction where there is a conflict. Therefore, the most restrictive MA was assigned where multiple management areas apply. The following guide was used in depicting how MAs should be displayed on hard copy maps within the land management plan.

	<b>Management Area(s)</b>
<div> <div>More restrictive</div> <div>↑</div> <div>↓</div> <div>Less restrictive</div> </div>	Congressionally Designated Wilderness, Designated Wild and Scenic Rivers, Cradle of Forestry, Experimental Forests
	Recommended Wilderness
	Research Natural Areas
	Heritage Corridors
	Roan Mountain
	Appalachian Trail
	Backcountry
	National Scenic Byways
	Special Interest Areas
	Ecological Interest Areas
	Interface
	Matrix

For example, where the Appalachian Trail passes through Congressionally Designated Wilderness, the map will show the area as Congressionally Designated Wilderness although both sets of plan components apply. In another example, where a National Scenic Byway is adjacent to the Cradle of Forestry, the area is mapped as the Cradle of Forestry. In many places, the Special Interest Areas MA underlies other MAs, (i.e., Recommended Wilderness); however, management of these areas will still be consistent with management direction for both SIAs and the overlapping MA.

To avoid double counting acres that appear in multiple MAs, only the most restrictive acreage is used in MA acreage tables.

The Designated Old Growth Network is not a MA and overlaps MAs.

## Management Approaches

While plan objectives describe what actions will be accomplished, management approaches give the public and others an understanding of how outcomes will be delivered. Management approaches describe the principal strategies and priority priorities that the forest will use to carry out projects and activities developed in the plan. Management approaches convey a sense of priority and focus among objectives and the likely management emphasis and also describe partnership opportunities that support the achievement of desired conditions and objectives. Management approaches are optional content in the plan that are not considered plan components.

## Plan Component Coding

The forest plan displays plan components with code identifiers to distinguish them from other language of the plan. The forest plan also uses a unique coding system to reference plan components more easily. Plan components are identified using the following pattern: LOCATION-TYPE-##-. The series of letters before the first dash references either the forestwide resource topic or the geographic area or management area. The second series of letters reference the type of plan component (Desired Condition, Objective, Standard, Guideline or Goal). The final series provides a number for easier identification of plan components. For example, the code AIR-DC-01 refers to the Air Resources section of the plan, Desired Condition number 1; while BAC-S-11 refers to the Backcountry Management Area, Standard number 11. See the acronym guide to the coding system below.



Location	Forestwide Resource	Geographic Areas	Management Areas
	PI = Public Involvement COM = Community Connections AIR = Air CC = Climate Change GEO = Geologic Resources WSD = Watershed SLS = Soils WTR = Water AQS = Aquatic System SZ = Streamside Zones ECO = Terrestrial Ecosystems WLF = Wildlife PAD = Plant and Animal Diversity OGN = Designated Old Growth Network FHL = Forest Health TIM = Timber FR = Fire and Fuels LSU = Lands and Special Uses TA = Transportation and Access FAC = Facilities REC = Recreation SC = Scenery CR = Cultural Resources TR = Tribal Resources NTFP = Non-timber Forest Products MIN = Minerals & Energy CE = Conservation Education & Interpretation	BAM = Bald Mountains BLM = Black Mountains EE = Eastern Escarpment PL = Pisgah Ledge NS = North Slope HD = Highland Domes GB = Great Balsam NM = Nantahala Mountains NG = Nantahala Gorge FL = Fontana Lake HW = Hiwassee UM = Unicoi Mountains	INT = Interface MAT = Matrix BAC = Backcountry EIA = Ecological Interest Areas SIA = Special Interest Areas AT= Appalachian National Scenic Trail Corridor SB = National Scenic Byways HC = Heritage Corridors WSR = Wild and Scenic Rivers RNA = Research Natural Areas CWD = Congressionally Designated Wilderness RW = Recommended Wilderness and Wilderness Study Areas EXF = Experimental Forests RM = Roan Mountain CF = Cradle of Forestry in America
TYPE	<b>Plan component</b>  DC = Desired Condition O = Objective S = Standard G = Guideline GLS = Goals		

## Consistency of Projects with the Forest Plan

All projects and activities authorized by the Forest Service must be consistent with the forest plan (16 USC 1604(i) and 36 CFR 219.15(b-c)). If a proposed project or activity is not consistent with a plan component, the responsible official has the following options (subject to valid existing rights):

- Modify the proposed project or activity to make it consistent with the applicable plan components;
- Reject the proposal or terminate the project or activity;

- Amend the plan so that the project or activity will be consistent with the plan as amended; or
- Amend the plan contemporaneously with the approval of the project or activity so that the project or activity will be consistent with the plan as amended. This amendment may be limited to apply only to the project or activity. (36 CFR 219.15(c)).

The following criteria should be used in determining if a project or activity is consistent with the forest plan (36 CFR 219.15(d)):

**1. Desired conditions, objectives, and goals.** A project is consistent with plan desired conditions, objectives, or goals when it:

- a. Maintains or makes progress toward attaining one or more plan desired conditions, objectives, or goals applicable to the project;
- b. Has no effect or only a negligible adverse effect on the maintenance or attainment of applicable desired conditions, objectives, or goals;
- c. Does not foreclose the opportunity to maintain or achieve any of the applicable desired conditions, objectives, or goals over the long term, even if the project (or an activity authorized by the project) would have an adverse short-term effect on one or more desired conditions, objectives, or goals; or
- d. Maintains or makes progress toward attaining one or more of the plan's desired conditions, objectives, or goals, even if the project or activity would have an adverse but negligible effect on other desired conditions, objectives, or goals.

The project decision document should include an explicit finding that the project is consistent with the plan's desired conditions, objectives, and goals, and briefly explain the basis for that finding. In providing this brief explanation, the project decision document does not need to explicitly address every desired condition, objective, and goal set forth in the plan. Rather, a general explanation is all that is needed so long as the consistency finding is made based on a consideration of one of the four factors noted above.

When a categorical exclusion from NEPA documentation applies, and there is no project decision document, the finding and explanation should be in the project record.

**2. Standards.** A project or activity is consistent with a standard if the project or activity is designed in exact accordance with the standard. The project documentation should confirm that the project or activity is designed in exact accordance with all applicable plan standards. The responsible official can make a single finding of consistency with all applicable standards rather than having to make individual findings.

**3. Guidelines.** A project or activity must be consistent with all guidelines applicable to the type of project or activity and its location in the plan area. A project or activity can be consistent with a guideline in either of two ways:

1. The project or activity is designed exactly in accordance with the guideline, or
2. A project or activity design varies from the exact words of the guideline but is as effective in meeting the purpose of the guideline to contribute to the maintenance or attainment of relevant desired conditions and objectives.

The project documentation should briefly explain how the project is consistent with the applicable plan guidelines. When the project is designed in exact accordance with all applicable guidelines, the

project documentation should simply confirm that fact in a single finding of consistency with all applicable guidelines. When the project varies from the exact guidance of one or more applicable guidelines, the project documentation should explain how the project design is as effective in meeting the purpose of the guideline(s) as the exact guidance in the guideline(s).

4. **Suitability.** A project or activity can occur in an area that the plan identifies as suitable for that type of project or activity; or for which the plan is silent with respect to its suitability for that type of project or activity.

Plans may have **other content** such as background, collaboration strategies, context, existing conditions, glossary, introduction, monitoring questions, other referenced information or guidance, performance history, performance measures, performance risks, program emphasis, program guidance, program priorities, possible actions, roles and contributions, management challenges, or strategies, but project consistency is not required for such other content.

## Plan Organization

This plan is organized in several parts:

Chapter 1—**Introduction** briefly describes the planning area and its context and a summary of the assessment report.

Chapter 2—**Forestwide Plan Direction** includes forestwide desired conditions, objectives, standards, and guidelines for resource topics that span the entirety of the Forests.

Chapter 3—**Geographic Areas** provides direction for the Forests' distinct landscapes, recognizing opportunities for restoration and sustainable recreation, connections to nearby communities, and partnerships with the public, other organizations, and governments in each part of the Forest.

Chapter 4—**Management Areas** provide direction for areas of the Forests that have similar management intent and a common management strategy, including congressionally and administratively designated areas.

Chapter 5—**Monitoring and Adaptive Management** outlines the plan monitoring program and provides a framework for subsequent monitoring and evaluation designed to inform adaptive management.

Appendices (contained in separate files)

- **Appendix A: Consolidated Forest Plan Objectives** identifies all the plan objectives in one location, organized by theme.
- **Appendix B: Timber Calculations** contains information on the planned timber sale program, timber harvest levels and methods of forest vegetation management practices expected during the plan.

Accompanying documents (contained in separate files)

- Environmental Impact Statement (EIS) for the Nantahala and Pisgah National Forests Land Management Plan and appendices

## Chapter 1: Introduction to the Nantahala & Pisgah National Forests

The Nantahala and Pisgah National Forests (Forests) are located in western North Carolina (WNC) in an 18-county region. Pisgah National Forest (NF) was established in 1916 and Nantahala NF in 1920. The two National Forests together now total approximately 1.04 million acres.

The Nantahala and Pisgah National Forests are two of four forests administered by the National Forests in North Carolina. Further east in North Carolina are the Uwharrie and Croatan National Forests, which are covered by different land management plans. This plan provides direction for the Nantahala and Pisgah Forests due to their similarity in forest resources.

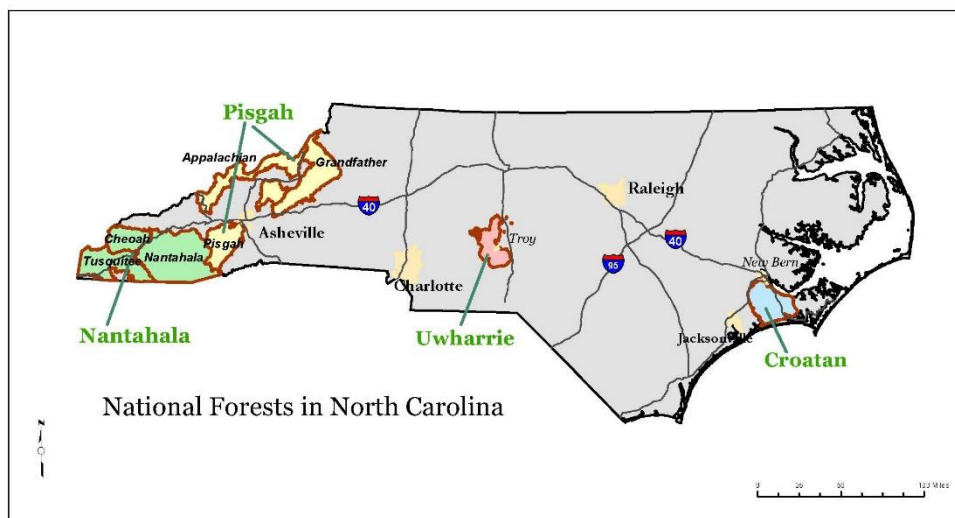


Figure 1. Vicinity map

The landscape of the Forests is diverse and characterized by mountain ranges with 125 peaks exceeding 5,000 feet overlooking numerous deep gorges and broad river valleys. Forest lands span from undeveloped backcountry to developed recreation areas broadly bordering the urban corridor centered around Asheville and other western North Carolina communities.

With over a half million acres across the mountains and valleys of southwestern North Carolina, the **Nantahala National Forest** is the largest of the four National Forests in the state. “Nantahala” is a Cherokee word that is interpreted to mean the sun only reaches the forest floor at midday—a fitting name for the Nantahala Gorge. The National Forest is divided into three ranger districts: Cheoah, Nantahala and Tusquitee. Elevations in the Nantahala National Forest range from 5,800 feet at Lone Bald in Jackson County to 1,200 feet in Cherokee County along Hiwassee River below Appalachian Lake Dam.

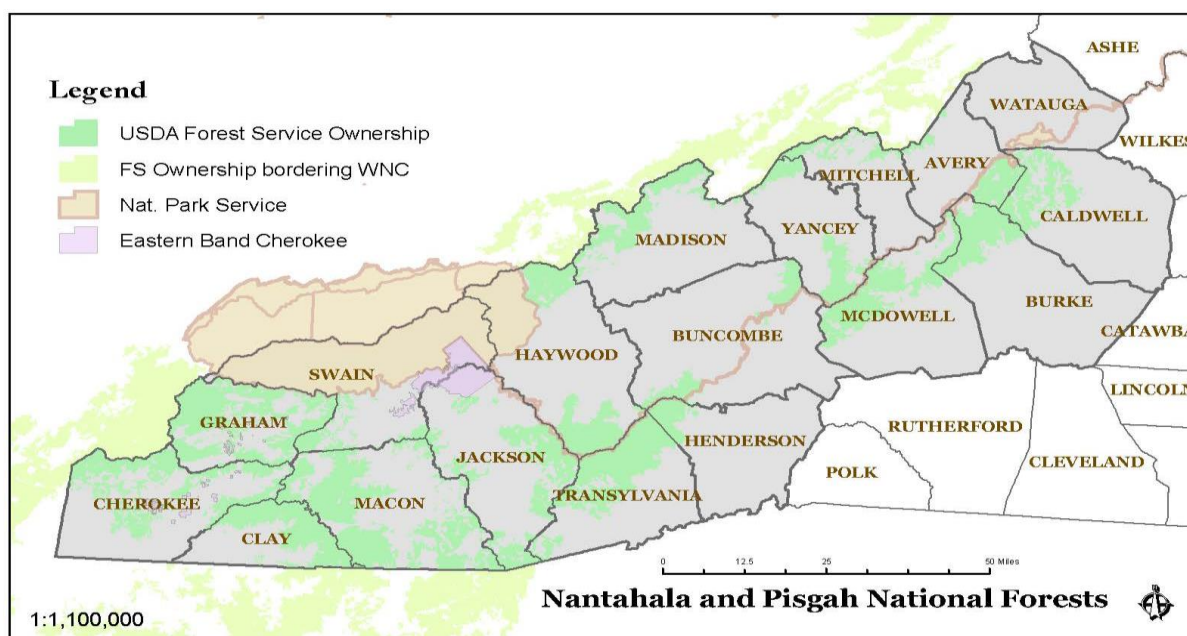
The **Pisgah National Forest** is a land of mile-high peaks, cascading waterfalls, and heavily forested slopes. Comprised of more than 500,000 acres, the Pisgah is primarily a hardwood forest with whitewater rivers, waterfalls, and hundreds of miles of trails. This National Forest is home to the first tract of land purchased under the Weeks Act of 1911, which led to the creation of the National Forests in the Eastern United States. It is also home to the first school of forestry in the United States, now preserved at the Cradle of Forestry in America historic site, and boasts two of the first designated wilderness areas in the east. The Pisgah, Grandfather and Appalachian Ranger Districts are scattered along the eastern edge of the mountains of western North Carolina and offer visitors a variety of opportunities for outdoor recreation and enjoying the natural beauty of the mountains.

The rich cultural mosaic of the Blue Ridge Mountains and foothills of North Carolina has its origins in three separate continents—North America, Europe, and Africa. There are three major strands of this rich tapestry of cultural heritage including Cherokee Heritage, Scots-Irish Heritage, and African

Heritage. Native American use of the area dates back to at least 11,000 years ago, and the Forests have been the home of the Cherokee, Creek, and Catawba peoples. The region is densely populated with archaeological and active cultural sites tied to these tribes.

## Distinctive Roles and Contributions

The Nantahala and Pisgah National Forests provide environmental, social, and economic benefits to local and regional communities and across the nation, making the Forests an important and unique part of western North Carolina. The Forests make up 27 percent of all forested land in the 18-county plan area. While a high percentage of non-NFS lands across western North Carolina are available to provide important benefits, Forest Service lands take the lead in providing forested and other natural environments available for the personal benefit of people through recreation, spiritual use, and access to forest products. In addition, there are national, state, county, and city parks as well as state-managed forest lands available for public use; although, many of these lands do not offer the wide range of public access and public use opportunities available on NFS land in western North Carolina.



**Figure 2. Nantahala and Pisgah National Forests in context with western North Carolina counties and National Forest Service, National Park Service, and tribal lands**

The 18-county plan area is home to many third- and fourth-generation residents. In addition, many retirees and second-home owners have moved into the area over the years, both groups citing the natural beauty and cultural opportunities of the area as major reasons for their move. The town of Cherokee, NC, located within the Qualla Boundary in the far western part of the state, is the cultural center of the Eastern Band of Cherokee Indians. Approximately 8,000 of the 13,000 enrolled members of the Tribe live within the Qualla Boundary. Other Cherokee lands in North Carolina include the 2,255-acre parcel in Graham County, home to the Snowbird community, and 5,320 acres scattered throughout Cherokee County.

The WNC region is favored with abundant supplies of water and many localities depend at least in part on water coming from the NFS lands. The Nantahala and Pisgah NFs supply timber to the local mills, including high-quality hardwoods that may not be as available from private timberlands. Firewood, plus a wide variety of medicinal, edible, and horticultural and craft plants, is available from these

National Forests by permit, whereas other public lands may not provide those benefits. The unique geology of the Nantahala and Pisgah NFs has provided a distinctive opportunity for recreational mineral and gemstone collecting, reflecting the rich mining heritage of the region. The Forests contain areas of importance to members of several Native American tribes, ensuring that opportunities for traditional practices and access to sacred sites are preserved.

The Forests play an important role in sustaining the diversity of plant and animal communities present in the plan area. For example, the Forests contain a greater proportion of high elevation forests and other high elevation ecosystems including high elevation red oak, northern hardwood, spruce-fir, and beech gap/boulder field forests and Southern Appalachian balds, than are available in the surrounding landscape. These forest communities provide habitat for many rare or uncommon species of plants and animals such as Gray's lily, spruce-fir moss spider, and Carolina northern flying squirrel. Many of the plants and animals that comprise the highly diverse Southern Appalachian ecosystems may have opportunity to thrive across the broader landscape, but those that are rare or that require special conditions may be better protected or find refuge on parts of the landscape more common within the National Forest System lands and the unique habitats found there. Additionally, as reflected by the multitude of high elevation areas, there are hundreds of miles of cold water streams that support aquatic species of high ecological and public value, such as native brook trout.

Most of the forested land in WNC is privately owned; therefore, many residents and visitors do not have access for recreation, hunting and fishing, forest product gathering or mineral collecting. The Forests provide visitors and residents with that opportunity, providing access to both developed recreation areas and remote backcountry locations. The Nantahala and Pisgah NFs are among the most visited forests in the country and provide visitors with unique opportunities for a wide range of recreational activities and experiences that also provide economic support to surrounding communities. Many visitors to the forests are local; however, many also visit from neighboring states including Alabama, Georgia, Tennessee, Virginia, and West Virginia (Cordell and Tarrant 2002). The largest cities within an hour and a half driving radius include Atlanta, Knoxville, Chattanooga, Charlotte, and Winston-Salem. In addition, Asheville, NC, the Blue Ridge Parkway, and Great Smoky Mountains National Park draw national and international visitors.

A wide range of developed and dispersed recreational opportunities are offered in the Nantahala and Pisgah NFs. The majority of gamelands open for hunting in WNC are located in the Nantahala and Pisgah National Forests. Likewise, whitewater rafting and the economic benefits derived from outfitter guides are, for the most part, provided by rivers that run at least in part through NFS lands. Additionally, the preponderance of public land at the high elevations that allows for passage of the Appalachian National Scenic Trail and unobstructed views from the Blue Ridge Parkway are additional economic drivers to the local economies. These one-of-a-kind scenic attractions that are available on the Forests add to the sense of place for residents and draw tourists that contribute to local economies.

## **Public Involvement in Plan Development**

A forest plan that is reflective of diverse interests and communities can only be successfully implemented through sustained public involvement in an environment that is welcoming and inclusive. To encourage broad participation, the Forest Service created a range of opportunities for collaboration and interaction with agency staff. The final plan and final Environmental Impact Statement were built on an unprecedented degree of public and government involvement for the Nantahala and Pisgah NFs. The high level of collaboration and input that went into the development of the plan provides a foundation for equitable benefits from the forests and an increased understanding of the values of the diverse communities and individuals that care about the planning

area. The plan's strong emphasis on public involvement has provided a platform for diverse interests to work together into the future.

Forest leadership and the plan revision team invested in outreach, dialogue, and relationships with partners, community stakeholders, and non-traditional audiences to engage them early and often throughout the planning process. In building the plan, EIS alternatives, and the analysis, the Forest Service consulted with local citizens, resource professionals, state agencies, local governments, other Federal agencies, federally recognized tribes, non-government organizations, researchers, the academic community, and youth.

Additionally, three collaborative groups representing diverse interests were heavily involved with the plan revision process. Two very active collaborative groups met almost monthly, from the assessment stage onward, providing input at each stage of plan development: the Nantahala-Pisgah Forest Partnership and the Fish and Wildlife Conservation Council. To better understand areas of agreement among collaborators and around critical plan issues, the Forest Service sought the assistance of the National Forest Foundation (NFF), a congressionally chartered non-profit partner. NFF supported a formal collaborative process known as the Stakeholders Forum for the Nantahala and Pisgah Forests plan revision which brought interested members from both earlier collaboratives and others together regularly during the plan development phase.

Public participants had opportunities to engage in the planning process through public meetings, workshops, open houses, email, and postal mail. Emerging technologies such as social media and virtual meeting platforms were also utilized to respond to the need for virtual outreach during the COVID-19 pandemic. Outreach and collaboration efforts were designed to be inclusive and provide diverse participants with opportunities to learn about forest resources, provide input on plan components, and review and refine plan content.

County staff and elected officials were also extensively involved. Forest leadership and staff reached out to each of the 18 counties in the planning area on several occasions to ensure local values and interests were represented in the collaborative process.

Key stages of public input included activities prior to initiation, the plan assessment, identifying the need for change, development of plan content, and comment on the draft Environmental Impact Statement (EIS). A summary of the public participation activities at each of these key stages is outlined below:

- Prior to plan revision initiation – In February and March 2013, the Forest held six public meetings prior to initiating the forest plan revision process for the Nantahala and Pisgah National Forests. In October 2013, revision was formally initiated. Subsequently, forest plan components were shared early to provide the public with the opportunity to comment and provide input.
- Assessment – There were eight public engagement sessions during the assessment period which included presentations, small group discussions, and poster sessions. Attendees included local residents, members of organized recreation groups and sportsmen groups, tribal members, county and city planners, government officials, local business owners, outfitter guides, and environmental advocates. In September 2013, a draft Assessment was posted on the Forests' website. This document assessed current condition and trends on the landscape for a full range of ecological, social, and economic topics. This assessment, along with feedback from public meetings involving more than 500 people, led to the development of the Need for Change. The final Assessment document was released in March of 2014.
- Need for Change – There were six public open houses to gather additional information on what needed to change in the revised forest plan in November and December 2013. The open houses

were informal and designed for people to drop by and share ideas and feedback that was then used to craft a “Need for Change” statement. The Need for Change was published as the Notice of Intent (NOI) to revise the forest plan in the Federal Register on March 12, 2014. The NOI initiated formal scoping for the forest plan revision. The Need for Change was updated and finalized in response to public comment and posted to the Internet in June 2014.

- Developing the Plan Content – The Forest Interdisciplinary Team (IDT) conducted ten public meetings and several agency-to-agency and government-to-government meetings to gather information on plan components from April 2014 to November 2015. Beginning in February 2016, the IDT began sharing preliminary plan content on the National Forests in North Carolina (NFs in NC) website with the goal of providing transparent communication about how the plan is developing and to create opportunities for iterative input. The plan content was introduced to the public through two live webcasts via Facebook Live that also provided opportunities for the public to ask questions. These presentations were posted to the NFs in NC website for review at any time. In September and October 2016, six open houses were held across the Forests to provide the public the opportunity to discuss draft forestwide plan components. The Forest Service added a collaboration specialist position to the team in early 2017 to increase and diversify public engagement. During the summer of 2017, an additional six open houses were held to gather input on management area and geographic area maps and plan components. Interdisciplinary Team meetings were opened to the public between 2016-2017. Forest leadership reached out to all 18 counties in the planning area and met with numerous county officials and staff to ensure the local voice was included. All of the outreach efforts led to an unprecedented amount of public involvement for the National Forests in North Carolina. Forest leadership and staff met with federally recognized tribes 17 times leading up to the development of the proposed plan and draft EIS. A concerted effort was made to include diverse, non-traditional audiences through several local organizations. Input received informed the development of the plan and alternatives for the Environmental Impact Statement.
- Comment on the draft Environmental Impact Statement – In the lead up to the release of this proposed plan and the draft Environmental Impact Statement on February 14, 2020, outreach was conducted via a variety of media to be inclusive and appeal to diverse audiences. The Forest Service held meetings with county, state and federal governmental representatives, and provided copies of draft documents. During the NEPA comment period in winter 2019, there were numerous opportunities and formats for public engagement. In light of the COVID-19 pandemic, engagement efforts were adjusted to strictly virtual, including consideration of those with limited internet connectivity. Accordingly, the Forests extended the comment period to the end of June 2020. Nearly 16,000 public engagement contacts were made through the full range of media formats along with in-person and virtual meetings.

A detailed account of the public engagement that took place during the plan revision process is contained in Appendix H of the final Environmental Impact Statement.



## **Key Findings from the Assessment and Need for Change**

In September 2013, the Forests released an Assessment Report that documented the current conditions and trends across all resource areas on the Nantahala and Pisgah. That fall, the Forests hosted a round of public meetings to share key findings from the report and asked the public for input on what needed to change in the revised forest plan. An initial Need for Change was shared in March 2014, and after additional comments were received, it was revised and shared again in June 2014.

The June 2014 Need for Change identified a need to provide plan direction to address the following:

### **Across All Forest Resources**

- How forest management in all resource areas should be prioritized given varying budget and personnel levels likely to be available over the course of the planning cycle;
- Review the overall management area framework used in the 1987 Plan and consider modifications to reduce complexity and increase flexibility for restoration and creation of wildlife habitat;
- Update objectives to reflect realistic expectations regarding the amount of work that can be achieved within a planning cycle;
- Recognize and include plan components to guide and potentially enhance the role of the Nantahala and Pisgah NFs contribution to social and economic sustainability by supporting local cultures and economies through commodity production, including timber and other multiple-use products, and the service-based economy that includes recreation and tourism;
- Include plan direction regarding potential climate change impacts such as increases in storm events, flooding, wildfires, and other extreme weather;
- Incorporate opportunities for working across boundaries to manage landscapes with adjacent land managers, such as state and federal partners, tribes, and other land management entities;
- Update direction to be consistent with the 2012 Planning Rule and other recent laws and policies.

### **Ecosystems, Unique Habitats, and Rare Species**

- Restore habitat components such as tree species composition and canopy structure in a variety of ecosystems, including young and old growth forest;
- Manage, maintain, or restore ecosystems, watersheds, and unique habitats to better control non-native invasive species and to reconsider riparian area management;
- Address current and future forest health impacts including insect pests, diseases, and pathogens;
- Manage prescribed fire by incorporating direction with an integrated resource approach to prescribed fire activities and flexibility for restoration and maintenance of ecosystems;
- Identify priority watersheds for restoration;
- Clarify plan direction for the designated old growth network.

### **Wildlife and Fish Habitat**

- Restore declining aquatic and terrestrial wildlife habitat and consider species in decline, including game and non-game species;

- Increase the amount of young forest across the landscape;
- Improve aquatic passage in streams.

## **Recreation and Scenery**

- Transition recreational facilities to accommodate a sustainable level of use;
- Respond to changing trends in services, activities, and types of facilities desired by the public, while balancing those trends with fiscal reality;
- Address the sustainability of the trail systems considering changing trends in use, conditions, and maintenance capacity, including volunteer groups;
- Integrate scenery management as a part of ecosystem management for the National Forests.

## **Designated Areas**

- Clarify and update plan direction regarding designated areas including Special Interest Areas, Roan Mountain, the Appalachian Trail, and Experimental Forests;
- Conduct inventory and evaluation of potential additions to Wilderness and identify the eligibility of rivers for inclusion in the National Wild and Scenic Rivers System. Reconsider previous recommendations for Wilderness and update plan direction regarding management of Wilderness and Wilderness Study Areas, and other designated areas;
- Clarify management direction for the congressionally designated Cradle of Forestry in America;
- Clarify management for continued recreation at Bent Creek Experimental Forest while ensuring research objectives are met.

## **Roads**

- Manage roads given the reality of limited maintenance funds combined with the public's desire for motorized access to the forest;
- Manage a sustainable road system that includes road construction and reconstruction as well as direction for closing out unneeded roads, including temporary roads and roads in environmentally or geologically hazardous locations;
- Address the public's desire to access the National Forest.

## **Cultural and Tribal Resources**

- Recognize and manage traditional cultural properties and sacred sites, such as the Trail of Tears;
- Consider landscapes of cultural value in management area direction, including Cherokee town sites, historic trail corridors, and high elevation balds.

## **Special Uses**

- Update plan language regarding special use permitting.

The above is a summary. The full Assessment and Need for Change documents are available in the planning record and provide greater detail than the summary above.

## **Nantahala and Pisgah National Forests Plan Revision Themes**

Based on discussions with the public, the plan revision effort centered around four themes: connecting people to the land, sustaining healthy ecosystems, providing clean and abundant water, and partnering with others. These themes are described below and apply forestwide across all resource areas.

### **Connecting People to the Land**

From the very beginning, the forests of Western North Carolina have been recognized for their importance to people. The rich cultural mosaic of people who have called this region their home depend on the forest for scenic beauty, year-round outdoor play and exercise, spiritual renewal, traditional uses like hunting, fishing, and gathering, and economic opportunity.

Under this theme, the plan recognizes the contribution of the Pisgah and Nantahala NFs to communities and quality of life in the broader region, and the cultural traditions and economies that depend on the forest. Objectives address management of sustainable recreation, volunteerism, nature-based education, forest products, protection of cultural resources, and relationships with federally recognized tribes and improving inclusivity and diversity in connecting people to the land.

### **Sustaining Healthy Ecosystems**

The Nantahala and Pisgah NFs support a diversity of forest communities from southern pine to northern hardwood forests. When compared to the southern Appalachian Region, the forests contain a proportionally greater amount of high-elevation forests and southern Appalachian balds, rare plant and animal communities, and headwater streams than the greater region.

Under this theme, the plan focuses on improving the ability of forests to remain healthy and resilient, despite stresses and disturbances. Objectives under this theme address maintaining and improving the diversity of forest structure (age classes or seral stages), composition (species), and function; managing the use of silvicultural and fire tools; managing for wildlife habitat and rare species and communities; and controlling noxious weed and invasive plants.

### **Providing Clean and Abundant Water**

Water is a life-sustaining resource for the Nantahala and Pisgah NFs and the natural and local communities that depend on it. Beyond ecological communities, forest waters also support municipal water supplies, tribal lands, agriculture, and industry.

Under this theme, plan components focus on how management will contribute to sustainable surface water and groundwater flow, maintain natural hydrology and fish and wildlife habitat, control erosion, and stabilize streambanks and apply best management practices for water quality. Objectives under this theme address watershed improvement projects, maintaining water quality, road maintenance, stream restoration, habitat management, and mitigate effects of acid rain on NFS lands.

### **Partnering With Others**

The U.S. Forest Service collaborates with partners to enhance its mission to sustain the National Forests in North Carolina. Forest managers work with other federal agencies, state and local governments, tribes, and diverse partners across boundaries to achieve shared objectives. Working collaboratively allows us to accomplish more work on the ground than any one agency could do alone.

Plan direction under this theme prepares the Nantahala and Pisgah National Forests to be a model for partnerships. A section on public involvement describes how citizens and groups can engage in project development early in the process; tiered objectives that were requested by the public and partners

reflect additional outcomes that may be possible with the added capacity of partners and partner resources; and geographic area goals identify opportunities to accomplish cross boundary needs that serve the American public. The plan also emphasizes expanding the diversity of forest visitors, volunteers, and partners, and increasing public land employment pathways across all demographics.

## **Key Plan Concepts**

Across all themes, the forest plan is designed with the following integrating concepts in mind:

### **Safety**

North Carolina's National Forests contain great natural beauty and abundant forest resources, but caution must be taken because of potential hazards due to the region's geography, wildlife, and weather. Safety in the National Forests requires awareness about potential risks and preparation when visiting the Forests, especially the Backcountry and Wilderness areas where the rugged terrain, remote nature, wildlife and lack of developed facilities and access to supplies creates risks for unprepared visitors. The Forest Service continuously provides and will strive to improve efforts to educate employees and the public about the risks involved and the best ways to stay safe when visiting the Forests.

The Forest Service engages in law enforcement and fire suppression activities within the Forests to increase the safety of visitors, Forest Service property, and the property of adjacent landowners. It coordinates these activities with the activities of other Federal, state, and local agencies.

### **Collaborative Capacity**

The U.S. Forest Service collaborates with partners to enhance its mission to sustain North Carolina's National Forests. Collaboration provides opportunities to identify the breadth of human interests and the needs of the resources while seeking creative management approaches. The partnerships are voluntary, mutually beneficial and include non-government organizations, state agencies and members of the public.

Working collaboratively allows the execution of projects that exceed the capacity of the Forest Service's human and fiscal resources, furthering the mission to educate the public and provide a variety of interested parties stakeholders access to the Forests.

In recognition of these benefits, and to nurture a collaborative environment, Forest Service employees provide high quality customer service, striving to create a management environment characterized by collaboration, inclusivity, communication, and cooperation. Through these efforts, the National Forests in North Carolina models successful collaboration and partnership efforts in which diverse people representing the breadth of the region's demographics actively participate in caring for the land and maintaining the long-term sustainability of the Nantahala and Pisgah National Forest resources.

### **Sustainable Recreation**

The U.S. Forest Service provides the greatest diversity of outdoor recreation opportunities in the world, connecting people with nature in an unmatched variety of settings and activities. Through this connection, recreation is the portal for understanding and caring for natural resources, renewing body and spirit, passing of pastimes and values to future generations, and inspiring passion for the land. The Forest Service has adopted sustainable recreation as a core focus to ensure that everyone can connect

with their natural and cultural heritage through the Forests, which brings health and vitality to individuals and communities.

Sustainable recreation is the set of recreation settings, opportunities, access, and scenic character on the National Forest System that is economically, socially, and ecologically sustainable for present and future generations. Activities that build sustainable recreation improve the condition of the Forests, support resilient communities, generate economic growth, improve quality of life, forge partnerships and alliances, and promote citizen stewardship through the following actions:

- Providing a diverse range of quality, natural, and cultural resource-based recreation opportunities in partnership with people and communities.
- Protecting and restoring the natural, cultural, and scenic environment for present and future generations to enjoy.
- Partnering with communities, organizations, and public and private recreation providers to meet public needs and expectations, achieve financial sustainability, foster economic benefits to local communities, and create a shared vision for sustainable recreation.
- Performing and effectively managing through effective decisions, sound investments, and accountability.

## **Restoring and Maintaining Healthy Forests**

The nation's forests face challenges from multiple sources that can degrade the health of the forests and endanger communities that neighbor them. Stressors such as wildfire, drought, climate change, invasive species infestations, and general overuse threaten the health of our forest and watersheds and the people that rely on them.

To address these challenges, the National Forests in North Carolina are committed to restoring the forested ecosystems that are essential for providing all the benefits that people value from forests—clean air and water, carbon sequestration, habitat for native fish and wildlife, forest products, opportunities for outdoor recreation, as well as jobs and economic opportunity. Consequently, the restoring and maintaining of forested ecosystems is a central pillar guiding our future actions. The revised plan focuses on restoration at a landscape scale to make a positive impact on forest health.

Ecological restoration is a process that assists recovery of resilience and adaptive capacity of ecosystems that have been degraded, damaged, or destroyed. The objective of ecological restoration is to reestablish and retain biodiversity, health and productivity, ecological function and resilience of National Forest System lands.

With our collaborative partners, the Forest Service must focus on restoring and maintaining healthy forests to meet its mounting challenges. We use an all-lands approach, which considers the Forests in context with the surrounding landscape, because we know that problems do not stop at the Forests' boundaries; and we work every day to restore forested ecosystems to be resilient now and into the future.

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## Chapter 2: Forestwide Plan Components

Throughout this chapter, plan components (plan decisions) are displayed with coded bullets. Text, tables, or figures that do not contain a code do not constitute plan decisions. It is background material, explanations, or descriptions of management approaches.

### Public Involvement

#### Background

Public involvement with stakeholders in local communities and beyond provides opportunities for a greater sense of ownership and pride in the Forests. Proactive efforts reach both traditional and non-traditional users and lead to a greater citizen understanding, appreciation, advocacy, and participation in forest stewardship and conservation.

This forest plan was developed with extensive public involvement, and the Forests will continue this collaborative effort in the future to implement projects and monitor the plan, and, where needed, to adjust adaptively.

#### Desired Conditions

- PI-DC-01** The Forests are a model for successful collaboration and partnerships.
- PI-DC-02** Community participation and collaboration create a shared vision that results in shared-stewardship, integrated approaches, and aligned actions for the Forests, partners, and volunteers.
- PI-DC-03** Forest managers work with state and local governments, tribes, and partners across boundaries to achieve shared goals, to enhance our capacity for restoration, including the control of pests, non-native invasive species, and use of prescribed fire.
- PI-DC-04** Interested individuals and groups learn about activities and have an opportunity to engage in project development early in the process.
- PI-DC-05** Community participation and citizen involvement is common and integral to project design and implementation, resulting in stronger, more successful outcomes.
- PI-DC-06** Partnerships promote a connection to place, foster a sense of stewardship, and help move the Forests toward sustainable conditions.

#### Guidelines

- PI-G-01** In order to encourage meaningful public participation during preparation of integrated landscape projects, the Forest Service should facilitate collaboration among state and local governments and Indian tribes and participation of interested persons, except where emergency situations warrant an expedited time frame.

#### Management Approaches

Forest Service employees provide high quality customer service, striving to create a management environment characterized by inclusivity, collaboration, communication, and cooperation.

Encourage the formation of broadly-based user groups to assist, communicate, and support forest resource management activities. Work with interested individuals and user groups to promote responsible, safe, and sustainable public use practices and to help the Forest Service communicate with the public and interested organizations.

Forest personnel participate in the scheduled activities and meetings of partner groups where possible. Coordinating with these groups promotes and develops consistency among resource plans and integrates common land management goals and strategies.

As needed, review and update group volunteer agreements, favoring to develop Forest or multi-district group volunteer agreements where appropriate.

**See also:** Community Connections, Tribal Resources, Conservation Education, and Interpretation



## Community Connections

### Background

The Forests contribute to local quality of life, creating opportunities for sustainable economic development through tourism, recreation, and timber harvest; producing clean water; providing habitat vitally important to many native species; and serving as a source of wildlife, wilderness, and abundant recreation opportunities. By expanding access to the outdoors for all people, the Forest Service helps build the personal experiences that are the foundation of stewardship. Additionally, the Forests are uniquely positioned to help young Americans reconnect with our natural and cultural heritage, employ young people to work in the great outdoors, and inspire the next generation of conservation leaders.

### Desired Conditions

- COM-DC-01** The Forests contribute to economic vitality of the region by providing benefits, maintaining local cultures and traditions, connecting people to the land, and contributing to a greater quality of life.
- COM-DC-02** People connect to the land and to each other aided by high-quality public information, interpretive services, and environmental education programs/activities.
- COM-DC-03** National Forests in North Carolina become a partner of choice for volunteers and local communities as well as local and national organizations.
- COM-DC-04** Through shared-stewardship with partners and volunteers, the Forests provide unparalleled recreation settings and opportunities that showcase its unique niche.
- COM-DC-05** Partnerships promote a connection to place and foster a sense of stewardship.
- COM-DC-06** Sustainable Forests' settings and opportunities complement regional, local, and tribal programs and tourism strategies, and collaboration with tourism offices is fostered.
- COM-DC-07** The Forests provide locations for research partners to identify, test, and demonstrate sustainable ecosystem management techniques.
- COM-DC-08** Relationships with new entities are established in a manner that attracts non-traditional users and strengthens the connections between surrounding communities and the National Forest.
- COM-DC-09** All people and communities served by the Forest are engaged, including historically underserved populations. Diversity of visitors, volunteers, and partners continues to grow through existing and new relationships; and citizen involvement becomes more representative of the local community and nation's demographics and interests.

### Objectives

- COM-O-01** Tier 1: Every other year host a discussion with interested WNC local governments or their economic development offices to foster shared actions that support local jobs, attract tourism, and encourage coordination on public health and safety issues.
- COM-O-02** Tier 1: Annually ensure that volunteers and service participants have the appropriate supervision, coordination, program direction, safety training, certifications, and protective equipment to conduct their work in a safe and efficient manner and are

recognized for their time in service, significant accomplishments, and/or exemplary safety records.

### **Management Approaches**

Reconnect young people from all walks of life with nature and their cultural heritage while building pathways to careers in resource stewardship.

Work with partners under the authority of the Public Land Corps and Youth Conservation Corps Acts to hire young Americans who will help protect natural and cultural resources, advance our scientific understanding, and restore the natural environment.

Engage with partners to emphasize expanding the diversity of forest visitors, volunteers, and partners, and increase public land employment pathways across all demographics.

**See also:** Public Involvement, Tribal Resources

## Air

### Background

Air quality in western North Carolina meets National Ambient Air Quality Standards (NAAQS) for each of the six criteria pollutants (carbon monoxide, lead, nitrogen dioxide, ground-level ozone, particulate matter<sub>2.5</sub>, particulate matter<sub>10</sub> and sulfur dioxide).<sup>1</sup> Current and former emissions of sulfur dioxide and nitrogen oxides (such as from coal-fired power plants and automobiles) have impacted forest resources. Those pollutants, along with ammonia emissions from agriculture, form sulfur and nitrogen compounds. The deposition of sulfur and nitrogen compounds from the atmosphere affect the soil and water resources. Over time, the primary impact has reduced the ecosystem's ability to buffer acids and has accelerated the loss of nutrient base cations (such as calcium) that are essential to forest health. In some high elevation areas, additional anthropogenic impacts will reduce nutrient base cations in the soils and streams. While acid deposition has plummeted since the 1990's, nutrient losses will continue because of historic conditions, and impacts will continue over the life of the plan. While sulfur is the primary acidifying agent, the amount of nitrogen compounds in water samples collected within the Forests, except for Roan Mountain, reveals that vegetation and other microorganisms are using most of the deposited nitrogen, with little impacting streams. The Environmental Protection Agency is evaluating whether to identify critical loads of these pollutants in order to protect sensitive resources.

In addition to impacting ecosystem health, fine particles of sulfur are the largest contributor to visibility impairment in the region. Smoke from prescribed fires is not a significant contributor to decreased visibility. The EPA's Regional Haze Rule provides the regulatory framework to achieve natural background visibility by 2064 assisted by the Forest's operation of IMPROVE visibility monitors associated with its Class I Wilderness Areas.

### Desired Conditions

- AIR-DC-01** Visitors to the Forests experience clean air and clear vistas.
- AIR-DC-02** The Forests meet all NAAQS intended to protect human health and public welfare. Forest management activities are a minor contributor if any area exceeds the NAAQS.
- AIR-DC-03** Air pollution is no longer a threat to vegetation richness or health because the total nitrogen deposition is below the critical load, and ground-level ozone is below the critical threshold.
- AIR-DC-04** The total sulfur deposition is below the critical load. Both aquatic and terrestrial resources are on a path of recovery that may take decades, or even more than a century, to complete. Removal of nutrient base cations from forest management activities do not undermine ecosystem recovery.

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<sup>1</sup> The Federal Clean Air Act and its amendments direct the Environmental Protection Agency to establish NAAQS, the concentrations of air pollution that will protect the American public's health and welfare. The Clean Air Act also directs the EPA to designate any areas as non-attainment that exceeds the NAAQS based upon monitoring air quality. After classifying an area as non-attainment, the state or local air agency with jurisdiction must develop a plan to implement, which reduces air pollution emissions so the ambient monitors will measure concentrations meeting the NAAQS. The USDA Forest Service has no regulatory role; however, it does have an advisory responsibility under the Clean Air Act to protect federally mandated Class I areas under their management. The Class I areas are Joyce Kilmer-Slickrock, Shining Rock, and Linville Gorge Wilderness.

## Management Approaches

Continue to fulfill Federal Land Manager (FLM) responsibility (as delegated by the Department of Agriculture) for the protection of the three Class I areas. The forest supervisor, as delegated the FLM according to the Clean Air Act, will comment on all significant new sources of air pollution, from stationary sources, that may adversely impact one or more air quality related values, especially visibility. The air quality agency who has legal responsibility to issue the permit for the new source of air pollution will receive the FLM's comments.

The FLM continues cooperation with air quality agencies in the region by commenting on their plans to reduce air pollution emissions, so reasonable progress in visibility is occurring at the three Class I areas. In addition, continue monitoring visibility and the chemical compounds that cause visibility impairment near two of the Class I areas<sup>2</sup>.

Continue collaboration with the North Carolina Division of Air Quality by monitoring ambient ozone near the three Class I areas. Monitoring results aid us to determine if ground-level ozone may be harmful to the health of people, and if it is causing an adverse impact to sensitive vegetation within the Class I areas. The North Carolina Division of Air Quality uses the monitoring results to prepare a daily forecast during the growing season that advises the public if the air quality is likely to be unhealthy for them while visiting their National Forests.

Encourage state, local, and federal air agencies to reduce air pollution emissions so all areas of the Forests have both seasonal ozone exposures values below the critical threshold, protecting most of the ozone sensitive trees within or outside of the Class I areas from having a large biomass reduction. First, the cumulative ozone exposure (called the W126) needs to be below 14.5 parts per million-hours, or below the latest threshold. Second, there needs to be less than 4 hours with an hourly average ozone concentration of 0.100 parts per million or greater, or below the latest threshold.

Continue using available monitoring or atmospheric modeling results to estimate the total amount of sulfur and nitrogen deposition. Use this information to assess if the total amount of atmospheric nitrogen and/or sulfur deposition is below the critical load, which is the deposition threshold where no harm to sensitive resources is likely to occur within or outside of the Class I areas.

Encourage state, local, and federal air agencies to reduce air pollution emissions so all areas of the Forests have a total sulfur and nitrogen deposition below the critical load. Based upon current scientific understanding, the total sulfur deposition should be 1.2 kilograms per hectare per year (kg/ha –yr) or lower to protect natural resources against too much acidification. Total nitrogen deposition should be 9.8 kg/ha –yr or less to protect against changes in herbaceous species richness.

**See also:** Fire, Soils, Terrestrial Ecosystems (Standards)

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<sup>2</sup> The Joyce Kilmer/Slickrock Wildernesses area is represented by visibility data collected by the National Park Service in Eastern Tennessee.

## Climate Change

### Background

Forestlands across the Southern Appalachians are experiencing increased threats from fire, insect and plant invasive species, disease, extreme weather, and drought. Scientists project increases in temperature and changes in rainfall patterns that can make these threats occur more often, with more intensity, or for longer durations. Climate change will continue to directly and indirectly impact the Forests' natural resources. However, uncertainty in the degree of climate change and its associated impacts to ecosystems remains, such as how changes in growing seasons will drive various ecosystem processes.

The Nantahala and Pisgah National Forests play an important role in carbon sequestration and storage, serving as an overall carbon sink. They contain approximately 73 million metric tonnes of carbon, and carbon stocks are increasing.

By using and adjusting sound natural resource management practices to proactively account for predicted future conditions, the Forest Service can promote the immediate and long-term health of its forests. Ecozone abundance and distribution may be different as the climate changes. Human use of the Forests will change, including the number and location of forest users. Climate change is occurring at a global scale. The Forest Service considers climate change and strives to adapt to and mitigate its impacts on the Nantahala and Pisgah National Forests within the agency's fiscal and resource capacity. (See Chapter 5: Monitoring and Adaptive Management.)

### Desired Conditions

- CC-DC-01** The Nantahala and Pisgah are resilient to disturbance regimes allowing for adaptive capacity of landscape level plant and animal communities to respond to climate changes.
- CC-DC-02** Forest management practices reduces susceptibility of forest stands to water stress, insects and disease outbreaks and wildfire by creating diversity and redundancy within forest communities.
- CC-DC-03** Ecosystems continue to provide supporting and regulating ecosystem services<sup>3</sup> under changing and uncertain future environmental conditions. These resilient ecosystems provide a wide range of ecosystem services for local, regional, and national needs.
- CC-DC-04** Ecological conditions for habitat quality, distribution, and abundance contribute to self-sustaining populations of terrestrial and aquatic plants and animals.
- CC-DC-05** Water resources are resilient to disturbances and are used sustainably.
- CC-DC-06** Forest diversity across scales contributes to resiliency in the face of change.
- CC-DC-07** A range of geological settings are conserved at varying elevations to provide niche opportunities for a diversity of species to adapt to changes in climate.

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<sup>3</sup> Ecosystem services include supporting services (such as nutrient cycling, soil formation, and primary production), regulating services (carbon sequestration, air quality, climate regulation, water regulation, and erosion regulation), cultural services (land use, aesthetic values, spiritual and religious values, and recreation and ecotourism), and provisioning services (forage, forest products, energy, fuel, minerals, and fresh water).

- CC-DC-08** Renewable and non-traditional energy opportunities are considered, such as biomass, firewood, hydropower, geothermal, wind, and solar.

### **Management Approaches**

Managing ecosystems in the face of climate change focuses on maintaining or creating resiliency and adaptability. In the face of climate uncertainty, maintain a suite of adaptation and mitigation options, focusing on sustaining process and function. Identify and prioritize maintenance and restoration in the microsites most resilient to changing conditions, considering geological settings as well as biological characteristics.

Where there are species at risk that are susceptible to the effects of climate change, promote activities that support suitable habitat enhancement.

Consider and address future climate and potential species range shifts when planning restoration projects, facilitating species migration and adaptation when possible.

Monitor for new invasive species moving into areas where they were traditionally not found, especially in high-elevation communities. Utilize the monitoring information to assess threats and prioritize treating highly invasive infestations.

Restore native vegetation in streamside zones to help moderate changes in water temperature and stream flow and enhance habitat.

Anticipate and plan for changes in natural disturbance patterns.

Prepare for intense storms and fluctuations in base flow using methods that maintain forest health and diversity, including controlling soil erosion, relocating high risk roads and trails, and constructing appropriately sized culverts and stream crossings while retaining stream connectivity.

To maintain genetic resiliency, consider locally adapted genotypes for use in restoration projects.

**See also:** Forest Health, Geologic Resources, Minerals, Soils, Terrestrial Ecosystems

## Geologic Resources

### Background

The geologic resources in the Blue Ridge of western North Carolina are the foundation of the Nantahala and Pisgah National Forests' ecosystems and watersheds, representing a critical part of integrated resource management. The Forests' area endowed with a wide range of geologic resources, including groundwater, groundwater-dependent ecosystems, springs, scenic and unusual landforms, waterfalls, caves, minerals, field records of catastrophic events (floods and landslides), paleontological resources, and field records of climatic changes and Quaternary<sup>4</sup> ecosystems. Minerals and energy are addressed in the Mineral and Energy Resources section of the plan.

The Forests are located in the Blue Ridge Physiographic Province (Blue Ridge) of the Southern Appalachian Mountains. The Blue Ridge forms a southwest to northeast mountain range through western North Carolina with many areas over 4,000 feet in elevation. The Nantahala and Pisgah National Forests generally occupy the upper slopes of dissected, steep terrain and narrow mountain valleys.

Surface geologic processes are an important part of the natural disturbance regime in the Forests. These processes include mass wasting or landslides; flooding; stream processes; groundwater movement; waterfall processes; and the erosion, transport, and deposition of sediment. The processes are part of the natural disturbance regime in the mountains and affect the Forests in varying degrees every year. Some processes are geologic hazards that can create risks to public safety.

### Desired Conditions

- GEO-DC-01** As the foundation of the Forests' ecological and biological diversity, geological settings provide diversity that enables ecological restoration as well as adaptation in a changing climate.
- GEO-DC-02** Geologic resources provide economic, ecological, scientific, educational, interpretative, scenic, recreational, paleontological, and other benefits.
- GEO-DC-03** Groundwater systems, as well as groundwater-dependent ecosystems, are sustained within the natural range.
- GEO-DC-04** Geologic hazards (e.g., rockslides, waterfalls, acidic rock, etc.) are recognized and associated risks to public health and safety or facilities and infrastructure are minimized.
- GEO-DC-05** Ground-disturbing activities do not cause or contribute to geologic hazards, such as acid rock drainage and landslides.

### Standards

- GEO-S-01** Management activities consider geologic setting and are located and designed to avoid, minimize, or mitigate adverse effects on groundwater, groundwater dependent ecosystems, and other geologic resources with identified values.

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<sup>4</sup> The current and most recent of the three periods of the Cenozoic Era.

- GEO-S-02** The location of proposed roads, trails, facilities, and management activities shall be screened for the presence of geological hazards relevant to the geologic setting.<sup>5</sup> If geologic hazards are present, then location and design measures shall be provided for management activities that may affect or be affected by the geologic hazards.

### Guideline

- GEO-G-01** Identify, using the appropriate type and scale of geological mapping, the geologic components (processes, structures, materials, and landforms) relevant to proposed projects and integrate the components into siting and design of the project, restoration, ecological sustainability, and environmental analysis.

### Management Approaches

Provide for slope stability when designing the cut and fill slopes of roads, log landings, or other excavations by considering site-specific engineering geologic data such as dip slopes, orientation and density of bedrock fractures, incipient slope failures, suitability of excavation for fill on steep slopes, and effects of shallow groundwater on stability of cut and fill slopes.

Include the North Carolina Geologic Survey Landslide Geodatabase (current version) and County Landslide Hazard Maps when screening for landslide hazards. Where not available, the screening could include any other available landslide hazard mapping relevant to the project area.

On slope gradients of 40 percent or more, the design of cut and fill slopes of road, log landings, or other excavations may include a debris flow hazard and risk assessment including:

- i. Delineating the potential downslope path of a debris flow caused by a potential cut-slope or fill-slope failure by using the same or similar method of debris flow pathway delineation in North Carolina Geologic Survey County Landslide Hazard Maps.
- ii. Identifying the risks to public safety, infrastructure, and resources in the pathway of the potential debris flow.
- iii. Developing alternative designs to reduce the hazards based on the risks.

Identify and incorporate in forest GIS the landslide (debris flow) hazards, and conduct an assessment of the risk to forest resources, infrastructure, and public safety as appropriate.

Cooperate with the National Park Service to identify and assess unstable fill slopes on the Blue Ridge Parkway that may pose a debris flow hazard downslope.

Conduct early detection and loss prevention of unstable cut and fill slopes (roads, log landings, etc.) that may create a downslope debris flow hazard and risk to public safety on National Forest and non-Federal land.

Emphasize ditch and culvert maintenance to prevent blockages diverting surface flows onto fill slopes.

**See also:** Climate Change, Water, Facilities, Transportation and Forest Access, Energy and Mineral Resources

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<sup>5</sup> Depending on the local area where activities are proposed, geological hazards could include, but are not limited to landslide hazards, flood hazards, acid-producing rocks, asbestos-containing ultramafic rocks, waterfall hazards, or radon.



## Watershed

### Background

A watershed, or drainage basin, is the area of land that drains water, sediment, and dissolved materials to a common outlet at some point along a stream channel. Watersheds are an effective way of understanding the hydrologic regime of an area and the hydrologic affects from management activities; although they are often not sufficient to explain the larger ecosystem.

The 2012 Planning Rule requires land managers to identify watersheds that are a priority for maintenance or restoration (36 CFR 219.7(f)(1)). These priority watersheds and their proposed activities will concentrate on the explicit goal of maintaining or improving the Watershed Condition Framework (WCF) watershed condition class, which identifies each 6th-level watershed as properly functioning, functioning at risk, or impaired. The intent of this identification is to (1) protect high-value watersheds in good condition, (2) maintain the condition of watersheds to keep them from becoming threatened, and (3) improve impaired watersheds.

The Forests completed a watershed condition analysis in 2010 that analyzed 135 6<sup>th</sup> level watersheds of 10,000 to 40,000 acres (USGS Hydrologic Unit Code (HUC) 12's). Next, the National Forests in North Carolina utilized a collaborative working group of land managers, scientists, and water resource professionals to determine which watersheds are restoration priorities and what work can be reasonably accomplished in ten years on the Nantahala and Pisgah National Forests. Table 1 outlines thirty 6th-level watersheds identified by the collaborative for future prioritization for restoration by the Forests. From this list, the Forests will outreach to interested parties to select priority watersheds where watershed restoration action plans will be developed. This list may be adjusted based on new conditions; and when it is adjusted, this will be reflected in the bi-annual monitoring report.

Watershed restoration activities are not limited to priority watersheds. Where needs emerge, watershed restoration activities can occur across the forest, taking into consideration an all-lands approach and resources.

**Table 1. Priority 6th Level Watersheds Organized by Geographic Area**

(Note that some watersheds appear in multiple geographic areas.)

Geographic Area	Priority Watershed, 6th Level
<b>Bald Mountains</b>	060101060305 Cold Springs Creek-Pigeon River
	060101051202 Spring Creek
<b>Black Mountains</b>	060101050801 Dillingham Creek
	060101050803 Upper Ivy Creek
<b>Eastern Escarpment</b>	030501010502 Upper Wilson Creek
	030501010504 Lower Wilson Creek
	030501010501 Upper Johns River
	030501010505 Middle Johns River
	030501010506 Lower Johns River
	030501010303 Lake James-Catawba River
<b>Fontana Lake</b>	060102040107 Yellow Creek-Cheoah River
	060102040105 Santeetlah Creek
	060102020406 Alarka Creek
	060102020505 Lower Fontana Lake-Little Tennessee River

Geographic Area	Priority Watershed, 6th Level
<b>Great Balsam</b>	060102020407 Upper Fontana Lake-Little Tennessee River
	060102020407 Upper Fontana Lake-Little Tennessee River
	060102030105 Caney Fork
	060102020406 Alarka Creek
	060102030107 Wayehutta Creek-Tuckasegee River
	060102030101 Wolf Creek-Tuckasegee River
	060102030104 Cedar Cliff Lake-Tuckasegee River
	060101050101 North Fork French Broad River
	060102020203 Lower Cullasaja River
<b>Highland Domes</b>	060102020201 Upper Cullasaja River
	060102020203 Lower Cullasaja River
	060102030104 Cedar Cliff Lake-Tuckasegee River
	060102030101 Wolf Creek-Tuckasegee River
	060101050101 North Fork French Broad River
	030601020201 Headwaters Chattooga
	0306001020204 Upper Chattooga River
	030601020202 Headwaters West Fork Chattooga River
<b>Hiwassee</b>	060200020903 Shuler Creek
<b>Nantahala Gorge</b>	060102020407 Upper Fontana Lake-Little Tennessee River
<b>Nantahala Mountains</b>	060102020301 Buck Creek
	060200020202 Fires Creek
	060102020203 Lower Cullasaja River
	060101050402 South Fork Mills River
	060102030101 Wolf Creek-Tuckasegee River
<b>North Slope</b>	060101050402 South Fork Mills River
<b>Pisgah Ledge</b>	060101050202 Davidson River
	060101050705 Bent Creek-French Broad River
	060101050402 South Fork Mills River
	060101050403 Mills River
	060101050104 Catheys Creek
	060101050101 North Fork French Broad River
<b>Unicoi Mountains</b>	060102040107 Yellow Creek-Cheoh River
	060102040105 Santeetlah Creek
	060102020505 Lower Fontana Lake-Little Tennessee River
	060102020407 Upper Fontana Lake-Little Tennessee River

## Desired Condition

- WSD-DC-01** Watersheds are resilient and stable, supporting the quality, quantity, and timing of water necessary to protect ecological functions and support beneficial water uses including clean domestic and municipal water use, wildlife and fish habitat, and water-based recreation.

## Objectives

- WSD-O-01** Tier 1: Develop watershed restoration action plans for 10 priority watersheds for restoration over the life of the plan.
- Additionally, implement up to four watershed restoration action plans to improve the conditions of watersheds from “functioning at risk” to “properly functioning” over the life of the plan. While implementing these action plans, at least the following improvements will occur over the life of the plan:
- i. Improve a minimum of six to a maximum of 12 water quality and aquatic habitat conditions from “impaired” or “functioning at risk” to “properly functioning” condition.
  - ii. Restore a minimum of 15 to a maximum of 20 acres of stream and other wetland ecosystems, focusing on restoring floodplain connectivity, stream channel function (for example, large woody debris), and native riparian vegetation.
  - iii. Perform road maintenance activities on 15 miles of roads that are known to be hydrologically connected to the stream network, focusing on those causing degradation of aquatic ecosystems (see also Transportation and Access, TA-O-03).
  - iv. Perform trail maintenance activities on approximately 15 miles of trails, emphasizing trails within 100 feet of streams. Relocate trails that are adversely affecting aquatic health (see also Dispersed Recreation, REC-O-6).
  - v. Decommission unneeded roads that are adversely affecting aquatic health (see also Transportation and Access, TA-O-04).
- Tier 2: Implement 5 or 6 watershed restoration action plans over the life of the plan.
- i. Improve 12 to 20 water quality and aquatic habitat conditions from “impaired” or “functioning at risk” to “properly functioning” condition.
  - ii. Restore 20 to 100 acres of stream ecosystem, focusing on restoring floodplain connectivity, stream channel function (for example, large woody debris), and native riparian vegetation.
- WSD-O-02** Tier 1: Assess **acid neutralizing capacity** in one priority watershed annually and utilize the information to inform watershed management and restoration.
- WSD-O-03** Tier 1: Annually, conduct a **site-specific analysis of base cations** in 1 to 2 project locations where there is a concern for base cation depletion. Develop mitigation or restoration strategies when these strategies are necessary to restore or protect at-risk water, soils, flora, and fauna.

## Management Approaches

As part of watershed analyses, conduct surveys of identified sources of impairment from National Forest System lands and develop appropriate treatments in watershed condition framework action plans.

Incorporate new information from activities into watershed action plans when applicable.

Participate with NGO partners, tribes, state, and federal agencies in promoting high quality water resources.

During project planning, consider the management needs of classified waters (e.g. Outstanding Resource Waters and High Quality Waters).

**See also:** Water, Terrestrial Ecosystems, Tribal Resources

## Soils

### Background

The Pisgah and Nantahala Forests' rich ecological diversity stems from western North Carolina's wide range of elevation and rainfall. Soil conditions vary widely from the mountain tops to the river valleys, and precipitation ranges from 40 to 80 inches annually in the region.

Three major types of soil systems are predominant in western North Carolina. At the lowest elevations, the waters of the river systems and floodplains create a fertile soil system rich in microbial nutrients that support flourishing riparian ecosystems and provide ideal conditions for agricultural use. The high water-holding capacity of these soils prevents erosion and creates a buffer against flooding.

The low and intermediate elevation soil systems found between 1,400 and 4,600 feet vary considerably depending on factors such as elevation, slope, exposure to sunlight, and the type of vegetation they support. Many of these soils are highly acidic, making them unsuitable for agricultural use but capable of providing nutrients for a variety of forest ecosystems.

High mountain system soils occur at elevations above 4,600 feet. The lower temperatures of the higher elevation ecosystems create a soil environment with lower levels of microbial activity that support the grasses of the heath balds and stands of spruce-fir.

### Desired Conditions

- SLS-DC-01** Forest soils have adequate physical, biological, and chemical properties to maintain or improve vegetation growth, hydrologic function, nutrient cycling, carbon storage, and slope stability.
- SLS-DC-02** Soil productivity is sustained through nitrogen and carbon fixation, nutrient mineral release from parent material, decaying organic matter, and recycling of nutrients. Soils do not contribute sediment to streams at levels that negatively affect instream uses and lifecycles of aquatic species. Erosion and compaction are minimized as a result of our management activities.
- SLS-DC-03** Generally, soils dedicated to growing vegetation have a normal soil profile that is typical for undisturbed soils on similar landforms in the local area.

### Objectives

See Objectives in the Watersheds section above.

### Standards

- SLS-S-01** Vegetation management activities, road and trail design, and other proposed infrastructure projects shall be screened for the presence of highly erodible soils. If present, then location and design measures shall be provided to reduce erosion potential and effects to natural resources.

- SLS-S-02** On all soils dedicated to growing vegetation, at least 85% of the activity area<sup>6</sup> will be able to grow vegetation without Substantial Soil Impairment<sup>7</sup> Reforestation shall be accomplished within five years.

### Guidelines

- SLS-G-01** During planning of roads, trails, and other infrastructure, avoid hydric soils or mitigate adverse impacts to protect the function of these soils when no reasonable or practical alternative is available.
- SLS-G-02** During construction of roads, trails, and other infrastructure, the risk of soil erosion should be reduced by implementing mitigation measures such as erosion control matting, slash (tree branches, etc.) placement, seeding, and mulching. The minimum amount of soil should be exposed at any given time during project implementation.

### Management Approaches

Preventing extensive soil disturbance during management activities is critical for maintaining soil productivity and protecting water quality. Design measures to reduce erosion potential and effects to natural resources are implemented during the management activity and following project completion. Site-specific Best Management Practices are developed for soil-disturbing activities, which may include the following, in coordination with resource-specific plan direction and the needs of the activity location:

- Minimizing ground disturbance by designating equipment staging, parking and access routes.
- Developing an erosion and sediment control plan.
- Applying temporary and permanent soil protective cover to prevent accelerated erosion.
- Maintaining the natural drainage pattern of the area.
- Controlling, collecting, detaining, treating, and dispersing stormwater runoff from disturbed areas.
- Diverting surface runoff around bare soil areas with energy dissipation and sediment filters.
- Stabilizing steep excavated slopes.
- Using suitable species and establishment techniques to cover or revegetate disturbed areas while preventing and controlling invasive species.
- Installing sediment and stormwater controls before initiating surface-disturbing activities.
- Operating equipment when soil compaction, displacement, erosion, and sediment runoff would be minimized.

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<sup>6</sup> “Activity area” is the area of potential soil disturbance where management prescriptions are being implemented, for example: timber harvest units and prescribed burn areas. System roads and other facilities would be excluded from this area.

<sup>7</sup> “Substantial Soil Impairment” is detrimental changes in soil properties (physical, chemical, or biological) that result in the loss of the inherent ecological capacity or hydrologic function of the soil resource that lasts beyond the scope, scale, or duration of the project causing the change.

- Avoiding ground equipment operations on unstable, wet, or easily compacted soils and on steep slopes
  - Evaluating site conditions often to assess changing conditions.
  - Adjusting equipment operations as necessary to protect the site
- Installing suitable stormwater and erosion control measures to stabilize disturbed areas and waterways on incomplete projects before seasonal shutdown of operations or when severe storm or cumulative precipitation events that could result in sediment mobilization to waterbodies are expected.
- Routinely inspecting disturbed areas to verify that erosion and stormwater controls are implemented and functioning as designed and are suitably maintained. Prepare for unexpected failures of erosion control measures.

## Water

### Background

Forests and water are inextricably linked, and people are dependent on forested lands to provide clean, reliable water supplies for drinking, and to support local economies. Southern forests are important as they provide a water supply to major population centers in the region by contributing to municipalities, agriculture, recreation, warm and cold freshwater habitat, groundwater recharge, and freshwater replacement. Forest waters contribute to municipal water supplies in four Southeastern states: North Carolina, Tennessee, South Carolina, and Georgia. Additionally, many cities and towns in western North Carolina get more than 50 percent of their municipal water supply from the Nantahala and Pisgah NFs. Water on the Forests reaches lands managed by federally recognized tribes.

The health of the ecosystems and communities of western North Carolina depends on the quality of the region's water. Proper management of water requires managing healthy forests throughout the watershed and taking appropriate management precautions in all activities. One of the main aspects of protecting water quality is managing the streams and the lands immediately adjacent to the streams.

Streams and rivers are abundant on the Forests. Western North Carolina has no natural lakes, but there are several large man-made reservoirs that provide communities with water, flood control, and hydroelectric power. Recreation and fishing on the region's waters attract hundreds of thousands of visitors to the Forests each year (See: Recreation).

Based on NC Department of Environmental Quality surveys, the health of surface water sources is good from these largely protected watersheds. The quality or sustainability of ground water is not monitored by the Forest Service, thus little is known.

### Desired Conditions

- |                  |   |
|------------------|---|
| <b>WTR-DC-01</b> | Water quality is sustained at a level that retains the biological, physical, and chemical integrity of the aquatic systems and benefits survival, growth, reproduction, and migration of native and desired non-native aquatic and riparian species.  |
| <b>WTR-DC-02</b> | Water quality meets state and federal water quality standards, including those in the Clean Water Act, and supports designated protected uses and native and desired non-native aquatic species. Short-term exceedance of water quality standards (i.e., temporary period of declining water quality) due to management activity occurs only in the anticipation of long-term improvement of watershed condition and water quality. |
| <b>WTR-DC-03</b> | Abundant clean water is present on the Forests to meet the current and future needs of communities downstream.  |
| <b>WTR-DC-04</b> | The quantity and timing of waterflows in streams, seeps, springs, and wetlands is sustained at a level that retains or enhances essential ecological functions.   |
| <b>WTR-DC-05</b> | Streamflow will be sufficient to maintain state designated protected uses. Instream flows provide for recreational uses and wildlife habitat, including for fish and other aquatic species. They also provide for channel, floodplain, and riparian maintenance along with recharge of groundwater aquifers. Stream flows provide natural movement of aquatic biota.  |



- WTR-DC-06**     Emphasize the protection of all stream channels. Protect the integrity of perennial, intermittent, and ephemeral stream channels including their bed and banks.
- WTR-DC-07**     Stream channels and floodplains are dynamic and resilient to disturbances. The water and sediment balance between streams and their watersheds allows a natural frequency of low and high flows. Occasional flooding benefits the floodplain and does not disrupt normal stream characteristics (e.g., water and sediment transport, woody material) or considerably alter stream dimensions (e.g., bank full width, depth, slope, and sinuosity).
- WTR-DC-08**     Stream channels are connected to their floodplains and streamside zones so that high streamflow events are processed through the ecosystem without excessive scour or deposition.
- WTR-DC-09**     Stream channels degraded by historic activities are exhibiting improved trends in biological and hydrological function.
- WTR-DC-10**     Stream channels provide high quality and diverse habitat for aquatic and terrestrial species.
- WTR-DC-11**     Large woody debris is frequent in occurrence and is incorporated into channel morphology as single pieces and larger woody debris jams that promote channel form diversity and floodplain inundation.
- WTR-DC-12**     Groundwater is maintained in quality and quantity to provide for sustainable groundwater dependent ecosystems and flow to stream channels, thereby sustaining healthy wetland, riparian, and aquatic ecosystems, such as seeps and springs.

## Objectives

See Objectives in the Watersheds section above.

## Standard

- WTR-S-01**     Prevent visible sediment from reaching perennial and intermittent stream channel and perennial water bodies in accordance with North Carolina Forest Practice Guidelines Related to Water Quality (NC FPGs or latest).

## Guidelines

- WTR-G-01**     Minimize the number of stream crossings in the design of roads and trails. (See also, TIM-S-7 and TA-S-04).
- WTR-G-02**     Incorporate large woody debris into stream restoration design as often as practically possible, except where there is a more effective long-term solution, such as when a hard boulder structure is needed to protect a system road from streamflow scour.
- WTR-G-03**     Restoration of stream channels should be guided by natural channel simulation and design concepts, including reference reach analysis, to meet the needs of the stream ecosystem.
- WTR-G-04**     Changes in the streamflow regime should not be permitted where they would adversely impact stream function, except where short term impacts result in long-term improvement or where other public benefits are provided such as through special use authorizations.

## Aquatic Systems

### Background

There are two major aquatic systems on the Forests: flowing streams and rivers and ponds and reservoirs that are the result of system impoundment. There are no natural lakes known on the Nantahala and Pisgah National Forests.

Streams and rivers on the Forests are comprised of cold water, transitional and warmwater ecosystems. Coldwater ecosystems generally (but not exclusively) occur above 1,800', transitional systems generally occur between 1,800' and 1,500' and warmwater systems generally occur at elevations lower than 1,500'. Most aquatic resources on the Nantahala and Pisgah support cold water aquatic communities. Although transitional and warmwater ecosystems comprise a relatively small proportion of streams and rivers on the Forests, the high species diversity of these aquatic ecosystems is extremely important to Southern Appalachian ecology.

The Forests support a small number of ponds (50 acres or less across the Nantahala and Pisgah National Forests) that are managed primarily for recreational opportunities, such as fishing. Additionally, the Forests border several thousand acres of man-made reservoirs, most of which were built for hydropower production. In addition to power, these resources are managed primarily for recreation activities, such as fishing and boating. It is important to note that it is the shoreline that is owned and managed by the Forest Service. The reservoir water body itself is managed by partner agencies, although the Forest Service does cooperate in this management through the Wyden authority. Stream and river reaches below hydropower and other dams are included in the appropriate lotic ecosystem, as described above.

Additional information on wetlands, seeps, springs, and bogs is covered in the streamside zone and unique habitat sections. Aquatic invasive species information is found in the forest health and invasive species section. Water chemistry and physical properties are addressed in the water section.

### Desired Conditions

- AQS-DC-01** Aquatic ecosystems are diverse with properly functioning streams providing high quality habitat for all native and desired non-native (e.g., brown and rainbow trout) aquatic species, resulting in populations that are robust and resilient. In areas where trout populations are present, native brook trout are emphasized when possible.
- AQS-DC-02** Habitat in streams, rivers, and lakes provides opportunities for fish and other aquatic organisms (e.g., crayfish, mussels, insects, turtles, and salamanders) to hide, spawn, and forage.
- AQS-DC-03** Areas along streams and rivers and around ponds and reservoirs are dominated by native vegetation capable of influencing water temperature, adding large woody debris, hydrologic stability, aquatic habitat diversity, and nutrient input, such as leaves and other coarse organic material.
- AQS-DC-04** Aquatic habitat conditions promote thriving populations of game fish such as, but not limited to, trout, bass, and catfish.
- AQS-DC-05** Recreational fishing continues as a popular activity where opportunities do not pose a risk to native species' persistence.

- AQS-DC-06** Reservoir shoreline in the Forests' ownership provides a naturally replenishing source of complex shoreline and littoral zone habitat in reservoirs from fallen trees that also allows for enhanced recreational (angling) experiences.
- AQS-DC-07** Hydropower facilities and other impounding features affecting streams and rivers are managed to minimize and mitigate impacts on native aquatic species.
- AQS-DC-08** Streams, ponds, and reservoirs are not affected by sedimentation due to land management activities and forest uses.
- AQS-DC-09** Stocking of native aquatic species augments existing populations or restores previously occupied portions of species' ranges.
- AQS-DC-10** Similarly, stocking of hatchery-raised trout, sunfish and catfish improves angling in areas designated by the North Carolina Wildlife Resources Commission.

## Objectives

These objectives are designed to improve the entire aquatic community. They recognize that, sometimes, allowing disconnected populations of species to remain disconnected is best for sustainability of these species.

- AQS-O-01** Tier 1: Maintain and expand the occupied **range of native brook trout** across the Forests. Additionally, maintain or increase populations within this range over the life of the plan.
- AQS-O-02** Tier 1: Maintain and expand the occupied **range of freshwater mussels and other aquatic species of conservation concern and federally-listed species** across the Forests. Additionally, maintain or increase populations within this range over the life of the plan.
- AQS-O-03** Tier 1: Prioritize completion of **assessment of aquatic organism passage (AOP)** needs that improves the entire aquatic community and enables reconnection of fragmented populations of native brook trout and other aquatic federally-listed species or species of conservation concern (SCC) or restoration of these species to suitable unoccupied habitat.
  - a) Work with partners to complete the AOP needs across the Forests over the life of the plan.
  - b) **Replace a minimum of two impaired stream crossings annually** to improve aquatic organism passage and aquatic community connectivity across the planning unit.

## Standard

- AQS-S-01** Management activities shall be designed to avoid, minimize, or mitigate negative impacts on aquatic habitats and species unless the management objective is to protect a native species from encroachment by a non-native species. For example, road and trail stream crossings shall not permanently isolate populations of native aquatic species unless they protect them from non-native invasive species. Specifically, no activities shall be undertaken to expand the range of non-native trout species into areas that are potentially suitable for or occupied by native brook trout.

## Guidelines

- AQS-G-01** Management activities should follow all applicable North Carolina and National Core Best Management Practices (BMPs) to meet relevant laws, regulations, and policies as described in the streamside zone and water resources sections. Exemptions to regulatory policies may be requested on a case-specific basis where application of the standard policy could result in greater resource damage. For example, the trout spawning moratorium on in-stream construction may be adjusted or waived if completing the project within restricted time period will have long-term benefits that outweigh short-term risks. Note that this type of process often requires communication with and documentation from partner agencies and organizations.
- AQS-G-02** No pesticide or herbicide, except as described below, should be aerially applied within 200 horizontal feet nor ground-applied within 30 horizontal feet of perennial streams, intermittent springs and streams, wetlands, or open bodies of water without specific advice from the appropriate resource specialists. No pesticide or herbicide, except as described below, should be applied within 100 horizontal feet of any public or domestic water source.
- Selective treatments, which require added site-specific analysis and use of aquatic-labeled chemicals, may occur within these buffers to prevent environmental damage such as non-native invasive plant infestations, or to restore riparian habitat. Buffers are clearly marked before treatment, so applicators can easily see and adhere to them.
- AQS-G-03** Installation of new stream crossings, or their replacement, should avoid fragmenting existing populations of native aquatic species. Replacement of existing crossings should reconnect fragmented populations of native species (e.g., brook trout, freshwater mussels, hellbenders) or avoid fragmenting existing populations wherever relevant. Crossings that are barriers should be retained where they protect populations of native species (e.g., brook trout).
- AQS-G-04** Aquatic organism passage projects should use channel spanning structures or other stream-simulation techniques on fish-bearing streams unless protection of a native species from encroachment by a non-native species is being provided or there are no habitat or population benefits (e.g., there is no suitable habitat above the crossing).
- AQS-G-05** During forest management activities such as timber harvest or road maintenance, channel-spanning and other passage techniques should be considered to promote passage of aquatic organisms (e.g., over-sized sunken pipes that collect channel substrate and natural-bottom fords on closed system roads where stream channel gradient and approaches can provide resource protection). Use portable bridge decks at temporary crossings whenever practical to support the guidelines above.

## Management Approaches

Aquatic habitat characteristics for species identified in other current, relevant landscape-scale planning efforts such as the Eastern Brook Trout Joint Venture's Roadmap to Restoration and Conservation Strategy, North Carolina Natural Heritage Program's Aquatic Natural Areas, North Carolina Wildlife Resources Commission's Trout Management Plan, and the North Carolina Wildlife Resources Commission's Aquatic Species of Greatest Conservation Need (as identified in the North Carolina Wildlife Action Plan) are considered during management activities.

Sustain and improve aquatic habitat to benefit native aquatic species with management actions that support the conservation of key native species, including brook trout and species of greatest conservation need (SGCN) defined in the Wildlife Action Plan of the North Carolina Wildlife Resources Commission (NCWRC). Continue to expand the known occupied range of the SGCN aquatic species through increased inventory, improved aquatic organism passage, population augmentations, and species reintroductions.

**See also:** Unique Habitats, Water, Streamside Zones, Forest Health, and Invasive Species; Recreation Opportunities, Transportation, and Access

## Streamside Zones

### Background

The streamside zone consists of the aquatic ecosystem, all or part of the riparian ecosystem and associated plant and animal communities. This area includes, at a minimum, areas adjacent to perennial and intermittent streams and waterbodies, wetlands, and 100-year floodplains. These areas will be actively managed to protect and enhance, where possible, the distinctive resource values and characteristics dependent on or associated with these systems.

Streamside zones determine the nature, quality, and health of many components of a forest ecosystem, because they include the transition zone between aquatic and terrestrial communities. The plants and animals found in these zones vary across the forest and are most similar to the adjacent ecosystem. These zones are a primary influence on whether water quality is poor or excellent; whether stream fisheries habitat is rich with an abundance of large woody debris; whether high quality food and cover are available for terrestrial animals; and whether stream associated plant communities are maintained.

High quality streamside zones are those that maintain natural hydrologic function and optimize precipitation infiltration and runoff to enhance stream stability and minimize erosion. In-stream flow is maintained at levels necessary to perpetuate diverse communities of aquatic organisms in a healthy state.

Restoration activities within streamside zones will be conducted to improve the structural and compositional diversity of riparian area plant and animal communities without negatively influencing stream temperature, natural hydrologic function, or species movement.

In streams that flow only ephemeral, the streamside zone differs from perennial and intermittently flowing streams due to the lack of development of riparian and aquatic habitat features. The Forests recognize that ephemeral flowing streams are often headwater channels, connecting to a network of streams that support an abundance of aquatic life and other beneficial uses of water. Ephemeral water bodies are managed to retain their ability to filter sediment from upslope soil disturbances. Ephemeral watercourses are always above the water table and have short periods of flow in direct response to precipitation or snowmelt runoff, and they have enough energy to remove leaf litter, organic matter, and soil down to mineral soil. They do not contain riparian vegetation, fish, or aquatic insects with multiple-year larval life cycle phases.

Constructed drainage features, such as system road drainage ditches or ditches within parking areas, are not considered ephemeral channels. Channels caused as a result of increased storm runoff from man-made features (e.g., roads, trails, parking lots, etc.) are considered ephemeral channels only when they connect to the downstream stream network after leaving the constructed feature. Similarly, isolated areas or segments of ephemeral soil scour are not considered ephemeral channels, because they do not connect to the downstream stream network.

### Desired Conditions

- SZ-DC-01** Areas along streams and rivers and around ponds, reservoirs, and wetlands are healthy, functioning, and contain a diversity of forest compositions and structures representative of the appropriate ecozone. Streamside zones may vary based on site-specific conditions that consider geology, soils, vegetation, and water flows.

- SZ-DC-02** Streamside zones are dominated by native vegetation that provides shading to the streams, filters sediments from upslope areas, stabilize streambanks and reservoir shoreline, and provide potential large woody debris for aquatic habitat. Native trees in these zones influence water temperature and provide in-stream habitat and nutrients.

## Objectives

- SZ-O-01** Tier 1: Restore at least three acres of streamside zones annually to increase vegetation diversity.
- Tier 2: Restore at least 20 acres of streamside zones annually to increase vegetation diversity.
- SZ-O-02** Tier 1: Implement at least three stream channel improvement projects annually, using natural channel concepts, focusing on restoring floodplain connectivity, stream bank stability, and enhancement of aquatic habitat diversity.
- Tier 2: Implement at least six stream channel improvement projects annually, using natural channel concepts, focusing on restoring floodplain connectivity, stream bank stability, and enhancement of aquatic habitat diversity.

## Standards

- SZ-S-01** Vegetation management activities within streamside zones of perennial and intermittently flowing streams must contribute to ecosystem restoration and not compromise aquatic system and riparian structure and function with the exception of short term impacts for long-term improvements. For example, water temperature regulation, sediment transport, streambank stability, and recruitment of large woody debris must exhibit natural dynamics after treatment. In these areas other objectives must be secondary to ecosystem restoration. Streamside zones are delineated as:

- Within 100 feet of either side of (or perimeter around) perennial waterbodies (streams, ponds, and reservoirs);
- Within 100 feet of perennial springs, bogs, and other wetlands;
- Within 50 feet of either side of (or perimeter around) intermittent streams

Narrowing of the above widths are allowed in special circumstances when the project IDT determines that within “shallow valleys”, where a break in topography occurs within the streamside zone, water flow is directed away from the protected waterbody. The IDT shall also consider potential changes in shading, subsequent stream temperature changes, and wildlife habitat connectivity. Any alteration to streamside zones shall be documented in the project record. Additionally, all activities must be in compliance with the National Core BMP Technical Guide and the North Carolina Forest Practice Guidelines related to water quality.<sup>8</sup> While vegetation management is allowed within streamside zones, as described above, this area is not suitable for timber production.

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<sup>8</sup> The zones in this standard that influence project design are in addition to NC Best Management Practices and mitigation measures, thus providing more restrictive guidance than State BMPs alone. For example, 50 feet away from an intermittent waterbody, the state BMPs would apply; and the project must also contribute to ecosystem restoration and meet the other provisions of the standard.

- SZ-S-02** Avoid ground disturbing activities, such as skid roads and trails, temporary or permanent roads, log landings and loading areas, firelines, concentrated recreational use and waste disposal areas within streamside zones except for designated stream crossings or when placement of disturbance-prone activities outside of the streamside zone would result in more environmental disturbance than placing such activities within the streamside management zone. Satisfactory mitigation measures shall be designed. (See Terrestrial Ecosystems: Ecosystem Restoration through Silviculture or Timber Management Practices and Fire and Fuels)
- SZ-S-03** Do not remove large woody debris from streamside zones, unless it poses a significant risk to stream flow, water quality, aquatic or riparian habitat, or downstream infrastructure (e.g., bridges or other stream crossings). Need for removal of large woody debris in these zones is determined on a project-specific basis by a hydrologist or other aquatic specialist.
- SZ-S-04** In areas occupied by the Indiana bat (*Myotis sodalis*), northern long-eared bat (*M. septentrionalis*), or gray bat (*M. grisescens*), foraging and roosting habitat (i.e., a particular canopy density and snag characteristics) along intermittent and perennial streams shall be maintained.
- SZ-S-05** Within identified streamside zones, allow chemical treatment to improve native plant composition and growth; and for non-native invasive plant species, control with aquatic-labeled herbicides and/or adjuvants sprayed away from the water source. Applicators will use guards on the end of sprayer wands when applying along stream edges and banks. (see AQS-G-02)

## Guideline

- SZ-G-01** When stream crossing is needed by new road, trail and other management activities minimize potential effects of management (e.g., sedimentation of habitats, increased water temperature, etc.) on aquatic habitat and populations, and follow ECO-S-07 and TA-S-04 to meet soil and water quality standards. Additionally, existing roads and trails should be a priority for maintenance, relocation or decommissioning as appropriate in this zone.

## Management Approaches

The Forests monitor the implementation and effectiveness of Forestry Best Management Practices annually to document our status for meeting forest plan standards, North Carolina State water quality standards, and, ultimately, the Clean Water Act. Review of forest practice effectiveness occurs annually as part of our program of work, and a summary of monitoring findings is drafted. In response to monitoring results, less than effective practices are diligently corrected to meet management direction. A summary of monitoring results is presented in the Forest Plan Monitoring and Evaluation Report.

Manage ephemeral stream channels and their areas of impact to reduce the risk of erosion and sedimentation by minimizing disturbance during management. For example, temporary road and skid trail crossings are allowed but minimized, and timber is managed while minimizing soil disturbance and retaining vegetation for slope stability.

Follow the latest agency guidelines and label directions for using pesticides near waterways, such as is in the treatment of hemlock woolly adelgid.



**See also:** Aquatic Systems, Forest Health and Invasive Species, Terrestrial Ecosystems, Transportation and Access, Timber, and Water

## Terrestrial Ecosystems

### Background

The plan components in the Terrestrial Ecosystems section are designed to support the health and resilience of forests across the landscape, moving from the landscape scale (subsection: Forest Landscape Pattern and Connectivity) to the ecosystem scale (subsection: Ecosystem Management) and then to the specific needs of habitats types (subsection: Wildlife Habitats Across Terrestrial Ecozones). The next section titled Plant and Animal Diversity addresses species groups, rare species, and unique habitat needs. By providing coarse-filter direction first, the plan accounts for the needs of most native species that occur on the Forests before providing more fine-filter plan direction required for plants, animals, and unique habitats that is not covered at the broader scale.

The planning framework emphasizes ecosystem restoration and maintenance to achieve healthy systems. *Ecological restoration* is the process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed. Ecological restoration focuses on re-establishing the composition, structure, pattern, and ecological processes necessary to facilitate terrestrial and aquatic ecosystems' sustainability, resilience, and health under current and future conditions. Some ecosystem restoration objectives may be accomplished through passive management strategies, where no action or activity is needed, such as allowing forests to age toward desired conditions or allowing natural revegetation of roads and trails that are no longer in use. Other restoration objectives will require active management to maintain or restore ecological conditions. For example, restoration activities include prescribed burning to maintain or restore fire-adapted ecosystems. It is important to recognize that both active and passive restoration methods are needed for forest health, resiliency, and adaptive capacity to trend toward desired conditions, and that when restoration relies on active restoration practices, both commercial and non-commercial methods are appropriate. Forest priorities for ecological restoration are outlined in the Ecological Restoration Priorities subsection.

Ecosystem restoration will not return ecosystems to a former state, because contemporary constraints and conditions have caused ecosystems to develop altered trajectories. Instead, restoration focuses on re-establishing key characteristics such as the composition, structure, pattern, and ecological function necessary to make ecosystems sustainable, adaptive, resilient, and productive under current and future conditions. Ecosystem maintenance occurs when a currently healthy system or a restored system are sustained in that resilient state.

Plan direction is built on the assumption that ecosystems are most resilient when they have high ecological integrity, which is characterized by having composition, diversity, and functional organization comparable to those of natural habitats within a region. An ecological system has integrity when its dominant characteristics (e.g., elements of composition, structure, function, and ecological processes) occur within their natural ranges of variation and can withstand and recover from most perturbations imposed by natural environmental dynamics or human influences. This framework assumes that the past range of variability serves as a reference for functional and sustainable systems that are complex and adaptive in the context of global change. The *Natural Range of Variation* (NRV) is defined as the variation of ecological characteristics and processes over time and space. For this forest plan, NRV was used to understand landscape ecological integrity and does not constitute a management target. NRV is not the same as desired conditions. NRV is to be used at the landscape scale and should not be evaluated at the project level.

This plan emphasizes management of ecosystems to meet the ecological needs of each forest community. An ecological zone, or *ecozone*, is the finest scaled unit of land that can support a specific plant community or plant community group. Ecozone composition and structure evolve from ecological

processes, such as natural succession, but also from disturbances such as fire and other biotic and abiotic stressors. Across the landscape, ecozones represent landscape diversity and by extension, resiliency, through varied age classes and structural components, susceptibility to various disturbance regimes, and separate species composition and diversity.

## Forest Landscape Pattern and Connectivity

### Desired Conditions

- ECO-DC-01** Across the forest, patches and connectors of National Forest System land sustain a diversity of ecosystems and habitat types, providing ecological integrity and enhancing conditions for native species.
- ECO-DC-02** Some landscape patches develop mostly through natural succession and natural disturbance regimes. These patches are less frequently managed than other patches because of their location or because their desired management is relatively light. Due to the number and size of these patches, the areas are large enough for natural systems to evolve. High quality old growth characteristics develop over time and dominate these patches. A relatively small amount of management would continue in these lands, such as where the forest has uncharacteristic conditions that need to be restored.
- ECO-DC-03** Other landscape patches evolve through a combination of natural succession with both natural and human-caused disturbances. These patches contain the most actively managed landscapes where management contributes to the landscape's overall natural range of variation. These patches provide a mix of habitat types for a wide variety of species that depend on young forests as well as old. Young forests are provided in a patch size and arrangement to provide high quality habitat for species dependent on these forest conditions. Locally, young forest patch size will frequently exceed average natural disturbance gap size to provide for habitat diversity, benefit wildlife, and to facilitate restoration operations and financial considerations, but it will not contribute to exceeding the ecozone's NRV at the forest level.
- ECO-DC-04** Isolated smaller patch sizes that are surrounded by private lands contribute to the forested or open lands pattern in western North Carolina.
- ECO-DC-05** Connectors, in the form of linear corridors of forest, cross the landscape to facilitate species movement between patches.

## Ecological Restoration Priorities

### Desired Conditions

- ECO-DC-06** Ecological restoration is focused on restoring the key characteristics of ecozone composition and structure, function and processes needed to maintain those key characteristics over time.<sup>9</sup>
- ECO-DC-07** Across the landscape, departure from potential natural vegetation composition by ecozone improves over time through both active and passive restoration, leading to an increase in forest functions, resiliency, and adaptiveness.

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<sup>9</sup> As explained in the background, restoration is not an attempt to return to a past point in time but rather to a healthy functioning ecosystem.

- ECO-DC-08** Across the landscape, the amount of age class and structural departure from the natural range of variation reduces over time, increasing multi-scale community complexity, stability, and connectedness through a combination of natural disturbances and silvicultural practices, including fire.
- ECO-DC-09** Restoring ecozone composition and structure has multiple outcomes: enhanced forest health and resiliency; restored fire-adapted ecozones that have been degraded due to fire suppression; contributions to the local economy by providing forest products in a cost-efficient manner, ranging from high quality logs for veneer and dimensional lumber to small diameter logs for pulp, firewood, or emerging products; and research plots support by maintaining plots as well as future research needs.
- ECO-DC-10** Ecological restoration emphasizes both restoring species composition when it is departed from desired conditions and restoring structural classes.
- ECO-DC-11** Ecozones with drier moisture regimes and fire-adapted species that depend on fire return intervals are restored and maintained. For the first few entries, the desire is to burn at the restoration interval, and after restoration has been completed, then a maintenance interval is sufficient. Ecozones with moderate moisture regimes have less severe fire effects and longer fire return intervals for restoring or maintaining key characteristics.

## Ecosystem Management

Eleven ecozones on the Nantahala and Pisgah were modeled based on potential natural vegetation type (PNV) and mapped based on data collected from more than 5,800 plots across the Southern Blue Ridge using factors that control vegetation distribution, such as landform, geology, elevation, temperature, moisture, fertility, and solar radiation. The PNV type for each ecozone represents the vegetation, primarily species composition that may have been dominant on the landscape prior to Euro-American settlement, and is based on both the current biophysical environment and an approximation of the historical disturbance regime. This PNV is based on the best available science at the time the plan was developed and may not fully capture the complete range of diversity that was present as each of these ecozones developed. In addition to PNV, the ecosystem characteristics for composition incorporate consideration of past land use practices. The structural and age diversity that can be expected across each ecozone is based on a model of the Natural Range of Variability (NRV) using disturbance analyses described in more detail in the Assessment.

Table 2 summarizes key characteristics of each of these eleven ecozones on the Nantahala and Pisgah NFs:

- Spruce-Fir
- Northern Hardwood
- High Elevation Red Oak
- Acidic Cove
- Rich Cove
- Mesic Oak
- Dry-Mesic Oak
- Dry Oak
- Pine-Oak Heath
- Shortleaf Pine-Oak Heath
- Alluvial Forest and Floodplain

The key characteristics of each ecozone include the dominate vegetation composition, vegetation structure (canopy to herbaceous layers), landscape position, relevant ecological processes, and examples of a few (but not all) associated wildlife species.

Variation can occur within each ecozones, and the ecozones have subtypes that reflect their variation in composition and structure. Ecozone characteristics are not intended to be all inclusive but are helpful for describing differences between ecozones. The acres in the left column are an estimate of the number of acres in that ecozone based on the model of PNV across the landscape. The acres were identified by a model at a one-acre resolution.

Ranges (minimum to maximum values) that are presented were informed by current science. They provide a benchmark against which to assess the existing conditions as well as provide managerial flexibility to meet local project objectives. They help to inform ecological processes that define ecozone change over time. In a changing environment, they help to understand previous ecosystem conditions, therefore providing guidance for future land management changes.

While these key characteristics generally apply to each ecozone, in some situations when restoration of the terrestrial ecosystems interacts with goals and objectives of other resources or needs to address changes required for ecosystem adaptability, it may be appropriate to locally deviate from the NRV. Site specific projects will be designed to restore the landscape structure and pattern of ecozones by contributing toward desired conditions at the forestwide scale. Social and economic conditions will be considered during project design while providing for ecological resilience at local and landscape scales. It can be appropriate to be outside the range of key characteristics at the local scale in order to achieve social, economic, cultural, or ecological desired conditions at the landscape scale.

It is important to note that both PNV and NRV model expected conditions and will not exactly reflect conditions on the ground. PNV and NRV do not address all restoration needs, for example, loss of hemlock or chestnut. NRV is only a guide, and for some resources, serves as the best proxy for resiliency.

**Table 2. Key Ecozone Characteristics**

Ecological Zone	Key Characteristics
<b>Spruce-Fir (SF)</b>  (approx. 16,000 acres)	<p>Variation: Fraser Fir Forest (Rhododendron and Herb Subtypes), Red Spruce – Fraser Fir Forest (Herb, Rhododendron, Birch Transition Herb, and Low Rhododendron Subtypes)</p> <p>Canopy: % Fraser fir and red spruce &gt; 70% cover with yellow birch and fire cherry</p> <p>Shrub Layer: 30-70% Evergreen shrubs dominated by Catawba rhododendron</p> <p>Herbaceous Layer: Low density; bryophytes abundant</p> <p>High Elevation: &gt;4,800 feet, unevenly distributed across the Nantahala and Pisgah NFs with occurrences on Roan Mountains, the Black Mountains, and the Balsam Mountains</p> <p>Landscape occurrence on highest elevations on variable slopes grading into high elevation red oak, Northern hardwood, beech gap, boulderfield, grassy bald, or heath bald</p> <p>Embedded rare plant community types include high elevation rocky summits, montane acidic cliffs, and high elevation seeps</p> <p>Ecological Processes: Natural disturbance driven by high winds, low temperatures, hoar frost, frequent ice, and occasional snow; fire extremely infrequent</p> <p>Disturbance Gap Sizes: Range of patch sizes from single to multiple tree fall gaps spanning 1/8-1/4 acre to 50 acres (where balsam woolly adelgids have affected the forest)</p> <p>Community Patch Size: Highly variable, with patches ranging from 5-100+ acres, average size 10-20 acres</p> <p>Examples of Wildlife Species Associated with this Ecozone: At least six species of salamanders restricted to the highest elevations, numerous migratory songbirds (including several of the rarest migrants in NC), several species of terrestrial snails, and the federally-listed spruce-fir moss spider and Carolina northern flying squirrel.</p>

Ecological Zone	Key Characteristics
<p><b>Northern Hardwood (NH)</b></p> <p>(approx. 54,000 acres)</p>	<p>Variation: Northern Hardwood Forest (Rich, Acidic, and Steep Subtypes)</p> <p>Canopy: Yellow birch, sugar maple, yellow buckeye, beech, and scattered red oak, white ash</p> <p>Shrub Layer: Variable in subtypes from open with 20-25% cover to greater than 70%; great laurel and dog hobble dominate the dense subtype; hobblebush and red elderberry are dominant in the open</p> <p>Herbaceous Layer: Well-developed in rich subtype with up to 80 herbs, ramps prevalent, acidic and steep type less diverse dominated by Pennsylvania sedge</p> <p>Forest species composition at least 50 -70% hard mast producing with sugar maple, birch, beech, buckeye, and scattered oaks</p> <p>Elevation Range: 4,000 – 5,500 feet, evenly distributed across high elevations on the Nantahala and Pisgah NFs except on the Blue Ridge Escarpment</p> <p>Landscape occurrence on upper elevations in concave slopes grading into high elevation red oak, rich cove, acidic cove, mesic oak, beech gap, boulderfield, grassy bald, or heath bald</p> <p>Embedded rare plant community types include montane cliffs, spruce swamp forest bog complex and high elevation seeps</p> <p>Ecological Processes: Natural disturbance driven by high winds, ice storms, and occasional snow; fire infrequent</p> <p>Disturbance Gap Sizes: Range of patch sizes with single to multiple tree fall gaps spanning 1/8-1/4 acre being most prevalent; larger scattered patches where hemlocks are infested with the hemlock woolly adelgid or emerald ash borer or American beech have been impacted by beech bark disease; occasional wind/ice storms patches exceeding 20 acres or resulting in thinning to more open forest conditions</p> <p>Patch Size: Highly variable patches from 1-40+ acres, average size 10-20 acres</p> <p>Example of Wildlife Species Associated with this Ecozone: At least six species of salamanders restricted to the highest elevations, numerous migratory songbirds (including several of the rarest migrants in NC), several species of terrestrial snails, ruffed grouse, wild turkey, white-tailed deer, the federally-listed spruce-fir moss spider, and the Carolina northern flying squirrel.</p>

Ecological Zone	Key Characteristics
<p><b>High Elevation Red Oak (HERO)</b></p> <p>(approx. 40,000 acres)</p>	<p>Variation: High Elevation Red Oak Forest (Typic Herb, Rich Herb, Heath, Orchard, and Stunted Subtypes)</p> <p>Canopy: Red oak &gt;50 canopy; co-dominant white oak and northern hardwood species. American chestnut was formerly dominant, not present except for small trees</p> <p>Shrub Layer: 30-70% mix of deciduous and evergreen with dominance by highbush blueberry, flame azalea, highbush cranberry, great laurel, or mountain laurel</p> <p>Herbaceous layer: Lower density for closed canopy; moderate for open canopy</p> <p>Forest composition at least 50 to 70% hard mast producing, primarily oak species</p> <p>Elevation Range: 3,500 – 5,500 feet, evenly distributed across Nantahala and Pisgah NFs at higher elevations</p> <p>Landscape occurrence on primary and secondary convex slopes grading into northern hardwood, spruce-fir, mesic oak, beech gap, boulderfield, grassy bald, or heath bald</p> <p>Embedded rare plant community types include high elevation rocky summits and granitic domes</p> <p>Ecological Processes: Natural disturbance driven by high winds, low temperatures, more frequent ice, and occasional snow; fire frequency 18-25 years, oak decline, oak wilt, spongy moth in mature oak trees and groups</p> <p>Disturbance Gap Sizes: Range of patch size from single to multiple tree fall gaps to wind driven openings of 50+ acres</p> <p>Community Patch Size: Highly variable patches from 5-150+ acres, average size 25-35 acres</p> <p>Example of Wildlife Species Associated with this Ecozone: At least twelve species of terrestrial salamanders, several migratory songbirds, several species of terrestrial snails, ruffed grouse, wild turkey, white-tailed deer, and the federally-listed Carolina northern flying squirrel.</p>



Ecological Zone	Key Characteristics
<b>Acidic Cove (AC)</b>  (approx. 249,000 acres)	<p>Variation: Acidic Cove Forest (Typic Subtype), Canada Hemlock Forest (Typic and White Pine Subtypes), Chestnut Oak Forest (Rhododendron Subtype)</p> <p>Canopy: Tulip poplar, black birch, yellow buckeye, red oak, chestnut oak with scattered Fraser's magnolia, and eastern hemlock</p> <p>Shrub Layer: Typical dense, with 50-90% cover, evergreen shrubs dominated by 10-to-15-foot-tall great laurel</p> <p>Herbaceous Layer: Low density with scattered occurrences of vascular plants, bryophytes abundant</p> <p>Forest composition at least 50-70% hard mast producing</p> <p>Elevation Range: 2,000-4,500 feet, distribution continuous across Nantahala and Pisgah NFs</p> <p>Landscape occurrence in concave slopes in dendritic patterns grading into floodplain, rich cove, northern hardwood, and mesic oak ecozones as well as the rare mesic Carolina hemlock forest</p> <p>Embedded rare plant community types include Southern Appalachian bogs, spray cliffs, montane cliffs, and seeps</p> <p>Ecological Processes: Natural disturbance driven by wind and ice storms and hemlock woolly adelgid, fire infrequent</p> <p>Disturbance Gap Sizes: Range of patch size primarily single tree fall gaps, around 1/8 acre, to rarer 15-20 acre wind-blown areas</p> <p>Community Patch Size: Highly variable patches from 1-50+ acres, average size 10-20 acres</p> <p>Example of Wildlife Species Associated with this Ecozone: eastern hellbenders, green salamanders, and at least twelve other species of terrestrial salamanders, numerous migratory songbirds, several species of terrestrial snails, ruffed grouse, wild turkey, white-tailed deer, black bear, and several reptiles including coal skink, timber rattlesnake, eastern smooth earth snake, and eastern box turtle.</p>

Ecological Zone	Key Characteristics
<b>Rich Cove (RC)</b>  (approx. 199,000 acres)	<p>Variation: Rich Cove Forest (Montane Rich, Montane Intermediate, Foothills Intermediate, Foothills Rich, Red Oak, and Boulderfield Subtypes)</p> <p>Canopy: Tulip poplar, American basswood, white ash, cucumber tree, black birch, silverbell, black cherry prevalent with sugar maple on mafic rock derived sites</p> <p>Shrub Layer: mostly open, less than 30% cover, with spicebush, hydrangea, and sweet-shrub dominating</p> <p>Herbaceous Layer: Greatest diversity and density among common ecozones with densest sites exceeding 135 herbs</p> <p>Elevation Range: 2,000-4,500 feet, distribution continuous across Nantahala and Pisgah NFs, less common at lower elevations on the Grandfather and Tusquitee Ranger Districts</p> <p>Landscape occurrence in concave slopes in dendritic patterns grading into floodplain, acidic cove, northern hardwood, and mesic oak ecozones</p> <p>Embedded rare plant community types include montane cliffs and seeps</p> <p>Ecological Processes: Natural disturbance driven by wind and ice storms and emerald ash borer, fire infrequent</p> <p>Disturbance Gap Sizes: Range of patch size primarily single tree fall gaps, around 1/8 acre, to rarer 15-20 acre wind-blown areas</p> <p>Community Patch Size: Highly variable patches from 1-40+ acres, average size 5-15 acres</p> <p>Example of Wildlife Species Associated with this Ecozone: eastern hellbenders, green salamanders, and at least twelve other species of terrestrial salamanders, numerous migratory songbirds, several species of terrestrial snails, ruffed grouse, wild turkey, white-tailed deer, black bear, and several reptiles with overall declining trends, including coal skink, timber rattlesnake, eastern smooth earth snake, and eastern box turtle.</p>

Ecological Zone	Key Characteristics
<b>Mesic Oak (MO)</b>  (approx. 177,000 acres)	<p>Variation: Montane Oak-Hickory Forest (Acidic, Basic, Low Dry, and White Pine Subtypes)</p> <p>Canopy: White oak, red oak group, chestnut oak, pignut hickory, red hickory, mockernut hickory, and red maple</p> <p>Shrub Layer: Varies in density from 15-50% among types. In dense type dominated by deciduous species including buffalo-nut, bear huckleberry, and mountain holly</p> <p>Herbaceous Layer: Varies with high diversity within basic type to moderate diversity within acidic more common type</p> <p>Forest composition at least 50-80% hard mast, primarily oak species</p> <p>Elevation Range: 2,000-4,500 feet, distribution continuous across Nantahala and Pisgah NFs</p> <p>Landscape occurrence on mid convex slopes grading into high elevation red oak, dry-mesic oak, dry oak, rich cove, and acidic cove ecozones</p> <p>Embedded rare plant community types include montane cliffs, high and low elevation granitic domes, and seeps</p> <p>Ecological Processes: Natural disturbance driven by wind and ice storms, oak decline, oak wilt, and spongy moth in mature oaks and groups, fire frequency from 18-25 years</p> <p>Disturbance Gap Sizes: Range of patch size with single to multiple tree fall gaps, from 1/8 acre-1/4 acre to occasional 15-20 acre wind-blown areas and rarer 15-25 acre high fire intensity areas</p> <p>Community Patch Size: Highly variable patches from 3-50+ acres, average size 15-20 acres</p> <p>Example of Wildlife Species Associated with this Ecozone: multiple species of terrestrial salamanders, numerous migratory songbirds, several species of terrestrial snails, ruffed grouse, wild turkey, white-tailed deer, black bear, elk, and several reptiles with overall declining trends, including coal skink, timber rattlesnake, eastern smooth earth snake, and eastern box turtle.</p>

Ecological Zone	Key Characteristics
<p><b>Dry-Mesic Oak (DMO)</b></p> <p>(approx. 103,000 acres)</p>	<p>Variation: Dry-Mesic Oak Hickory Forest, Low Montane Red Oak, Montane Oak-Hickory Forest (Low Dry Subtypes)</p> <p>Canopy: white oak, mockernut hickory, chestnut oak, southern red oak, scarlet oak, red maple, and white pine</p> <p>Shrub Layer: Varies in density but typically greater than 50% with dominance by bear huckleberry, mountain laurel, sweet-shrub while low elevation types also have low-bush blueberry and flame azalea</p> <p>Herbaceous Layer: Varies depending on shrub density and fire frequency. Most types have low to moderate diversity. In comparison the low elevation type in a frequently burned landscape can have high diversity dominated by grasses, legumes, and aster family species</p> <p>Forest composition at least 50-80% hard mast producing, primarily oak species</p> <p>Elevation Range: 1,200-4,000 feet, distribution continuous across Nantahala and Pisgah NFs, more concentrated along Blue Ridge Escarpment on the Nantahala, Pisgah, and Grandfather RDs</p> <p>Landscape occurrence on low to mid convex slopes grading into mesic oak, dry oak, pine-oak/heath, shortleaf pine, acidic cove, and floodplain ecozones as well as rare calcareous oak-walnut woodlands, white pine forests, and shale slope woodlands</p> <p>Embedded rare plant community types include montane cliffs, high and low elevation granitic domes, low elevation glades, low elevation rocky summits, Carolina hemlock bluffs, and seeps.</p> <p>Ecological Processes: Natural disturbance driven by wind and ice storms, oak decline, oak wilt, and spongy moth in mature oaks and groups, and moderately common fires with a fire frequency from 15-20 years</p> <p>Disturbance Gap Sizes: Range of patch size with single to multiple tree fall gaps, from 1/8 acre-1/4 acre, to occasional 15-20 acre wind-blown areas and rarer 15-25 acre high fire intensity areas</p> <p>Community Patch Size: Highly variable patches from 3-150+ acres, average size 20-30 acres</p> <p>Example of Wildlife Species Associated with this Ecozone: multiple species of terrestrial salamanders, numerous migratory songbirds, several species of terrestrial snails, ruffed grouse, wild turkey, white-tailed deer, black bear, elk, and several reptiles with overall declining trends, including coal skink, timber rattlesnake, eastern smooth earth snake, and eastern box turtle.</p>

Ecological Zone	Key Characteristics
<p><b>Dry Oak (DO)</b></p> <p>(approx. 49,000 acres)</p>	<p>Variation: Chestnut Oak Forest (Dry Heath, Herb, and White Pine Subtypes)</p> <p>Canopy: chestnut oak, black oak, scarlet oak, white oak, red maple, mockernut hickory, pignut hickory, blackgum, Virginia pine, and shortleaf pine</p> <p>Shrub Layer: Varies in density but typically greater than 50% with dominance by heath family species such as bear huckleberry, mountain laurel, and low-bush blueberry</p> <p>Herbaceous Layer: Varies depending on shrub density and fire frequency. Most types have very low diversity with more moderate diversity in fire maintained woodlands with greater species such as grass, legume, and aster family species</p> <p>Forest Composition at least 50-80% hard mast producing, primarily oak species</p> <p>Elevation Range: 1,200-5,200 feet, distribution scattered across Nantahala and Pisgah NFs and concentrated in fire-maintained landscapes</p> <p>Landscape occurrence on steep upper convex slopes, typically south- or west- facing, grading into dry-mesic oak, mesic oak, pine-oak/heath, and shortleaf pine ecozones as well as rare serpentine barrens, montane red cedar-hardwood woodlands, white pine forests, and shale slope woodlands</p> <p>Embedded rare plant community types include montane cliffs, high and low elevation granitic domes, low elevation glades, low elevation rocky summits, and Carolina hemlock bluffs</p> <p>Ecological Processes: Natural disturbance driven by wind and ice storms, oak decline, oak wilt and spongy moth in mature oaks and groups and common fires with a fire frequency from 5-10 years</p> <p>Disturbance Gap Sizes: Range of patch size with single to multiple tree fall gaps from 1/8 acre-1/4 acre to occasional 15-20 acre wind-blown areas and rarer 15-25 acre high fire intensity areas, more common 1-10 acre fire created gaps</p> <p>Community Patch Size: Highly variable depending on fire frequency in the landscape, patches from 3-60 plus acres, average size 10-15 acres</p> <p>Example of Wildlife Species Associated with this Ecozone: multiple species of terrestrial salamanders, numerous migratory songbirds, several species of terrestrial snails, ruffed grouse, wild turkey, white-tailed deer, black bear, elk, and several reptiles with overall declining trends, including coal skink, timber rattlesnake, eastern smooth earth snake, and eastern box turtle.</p>

Ecological Zone	Key Characteristics
<p><b>Pine-Oak Heath (POH)</b></p> <p>(approx. 104,000 acres)</p>	<p>Pine-Oak /Heath Forest (Typic and High Elevation Subtypes)</p> <p>Canopy: Typically pitch pine or a combination of pitch pine and Table Mountain pine or a mix with of shortleaf pine at low elevations. Oaks across both elevations include scarlet oak, chestnut oak, and black oak.</p> <p>Shrub Layer: Varies depending on fire frequency; with greater fire shrub density less than 25% cover while where fire infrequent with density greater than 75%, shrub dominance by mountain laurel and low-bush blueberry</p> <p>Herbaceous Layer: Varies depending on shrub density and fire frequency. Fire infrequent types have very low diversity with more moderate diversity in fire-maintained woodlands with dominance by grasses, legumes, and aster family species.</p> <p>Elevation Range: 1,400-5,000 feet, distribution scattered across Nantahala and Pisgah NFs with concentrations in fire-maintained landscapes</p> <p>Landscape occurrence on steep to very steep upper slopes grading into dry oak, dry-mesic oak, shortleaf pine, and acidic cove ecozones as well as rare shale slope woodlands and white pine forests</p> <p>Embedded rare plant community types include montane cliffs, low elevation rocky summits, low elevation glades, Carolina hemlock bluffs and upland pools</p> <p>Ecological Processes: Natural disturbance driven by wind and ice storms, southern pine beetle, oak decline, oak wilt, and spongy moth in mature oaks and groups and frequent fires every 3-5 years</p> <p>Disturbance Gap Sizes: Range of patch size with single to multiple tree fall gaps, from 1/8 acre-1/4 acre, to occasional 15-20 acre wind-blown areas and rarer 15-25 acre high fire intensity areas</p> <p>Community Patch Size: Highly variable depending on fire frequency in the landscape, patches from 1-100+ acres, average size 15-20 acres</p> <p>Example of Wildlife Species Associated with this Ecozone: multiple species of terrestrial salamanders, numerous migratory songbirds, several species of terrestrial snails, ruffed grouse, wild turkey, white-tailed deer, black bear, elk, and several reptiles with overall declining trends, including coal skink, timber rattlesnake, eastern smooth earth snake, and eastern box turtle.</p>

Ecological Zone	Key Characteristics
<p><b>Shortleaf Pine-Oak Heath (SPOH)</b></p> <p>(approx. 46,000 acres)</p>	<p>Low Mountain Pine Forest (Shortleaf Pine and Montane Subtypes), Southern Mountain Pine-Oak Forest</p> <p>Canopy: Typically shortleaf leaf pine with co-dominance by southern red oak and pitch pine and less frequency of chestnut oak, scarlet oak, blackjack oak, hickories, and sourwood</p> <p>Shrub Layer: Varies depending on fire frequency; with greater fire shrub density less than 25% cover while where fire infrequent with density greater than 75%, shrub dominance by mountain laurel and low-bush blueberry</p> <p>Herbaceous Layer: Varies depending on shrub density and fire frequency. Fire infrequent types have very low diversity with more moderate diversity in fire-maintained woodlands with dominance by grasses, such as Ravenna grass and little bluestem; legumes, such as goat's-rue and butterfly pea; and aster family species, such as stiff aster and grass-leaved golden aster</p> <p>Elevation Range: Less than 1000-2,800 feet, distribution discontinuous across Nantahala and Pisgah NFs, concentrated on the Tusquitee and Grandfather Ranger Districts below 2,300 feet elevation with smaller patches scattered across the forest</p> <p>Landscape occurrence on low convex slopes grading into dry-mesic oak, dry oak, pine-oak/heath, acidic cove, rich cove, and floodplain ecozones as well as rare shale slope woodlands</p> <p>Embedded rare plant community types include montane cliffs, low elevation granitic domes and low elevation glades</p> <p>Ecological Processes: Natural disturbance driven by wind and ice storms, southern pine beetle, oak decline, oak wilt and spongy moth in mature oaks and groups and frequent fires every 3-5 years</p> <p>Disturbance Gap Sizes: Range of patch size with single to multiple tree fall gaps, from 1/8 acre-1/4 acre, to occasional 15-20 acre wind-blown areas and rarer 15-25 acre high fire intensity areas, more common 1-5 acres patches created due to fire</p> <p>Community Patch Size: Highly variable depending on fire frequency in the landscape, patches from 5-100+ acres, average size 20-25 acres</p> <p>Example of Wildlife Species Associated with this Ecozone: multiple species of terrestrial salamanders, numerous migratory songbirds, several species of terrestrial snails, ruffed grouse, wild turkey, white-tailed deer, black bear, elk, and several reptiles with overall declining trends, including coal skink, timber rattlesnake, eastern smooth earth snake, and eastern box turtle.</p>

Ecological Zone	Key Characteristics
<b>Alluvial Forest and Floodplain (AFF)</b>  (approx. 2,000 acres)	<p>Montane Alluvial Forest (Small River and Large River Subtypes)</p> <p>Canopy: Typically sycamore, tulip poplar, diverse ash, black birch, eastern hemlock, and white pine</p> <p>Shrub Layer: Depending on types can be very dense with greater than 80% density with great laurel and doghobble throughout and black alder, yellowwood, Virginia sweetspire, and silky dogwood covering the river banks. In more open types with more frequent disturbance, shrub density is less than 25% cover</p> <p>Herbaceous Layer: Varies depending on shrub density. Minimal diversity with dense shrub cover while in contrast high herb diversity in open sites with many annual species.</p> <p>Elevation Range: Less than 1000 -3,000 feet, distribution discontinuous across Nantahala and Pisgah NFs, with greater density at less than 2000 feet, greatest concentration in the Grandfather Ranger District</p> <p>Landscape occurrence on flat river and stream terraces grading into acidic cove, rich cove, dry-mesic oak, and mesic oak ecozones as well as rare Carolina hemlock mesic forest</p> <p>Embedded rare plant community types include floodplain pools, rock bar and shores and semi-permanent impoundments</p> <p>Ecological Processes: Natural disturbance driven by frequent flooding and variable size gaps driven by beavers, wind and ice storms, emerald ash borer and hemlock woolly adelgid, fire very infrequent</p> <p>Disturbance Gap Sizes: Range of patch sizes with flooding events or tree mortality opening up to 1 acre, tree fall gaps up to 1/8 acre and rarer wind events opening up 10-15 acres</p> <p>Community Patch Size: Ranging from 1-60 acres narrow linear configurations with average size 10-15 acres</p> <p>Example of Wildlife Species Associated with this Ecozone: eastern hellbenders, at least twelve species of terrestrial salamanders, numerous migratory songbirds, several species of terrestrial snails and bats, ruffed grouse, wild turkey, white-tailed deer, black bear, least weasel, Southern Appalachian water shrew, and several reptiles with overall declining trends.</p>

## Wildlife Habitat Across Terrestrial Ecozones

While ecozones provide the framework for maintaining or restoring ecological integrity, the following habitat types are desired across the broader landscape in all ecozones to:

- Maintain the diversity of plant and animal communities;
- Support the persistence of native species within Forest Service authority and in ways consistent with the inherent capability of the plan area; and
- Sustain wildlife, fish, and plants commonly enjoyed and used by the public for hunting, fishing, trapping, gathering, observing, and subsistence. (36 CFR 219)

Most of these habitats are supported through restoration of ecozone composition or structural classes as displayed above.



## Desired Conditions

- WLF-DC-01** Young forests with seedlings and saplings are distributed across all ecozones and elevations but especially in higher elevation montane oak ecosystems for species such as ruffed grouse, golden-winged warbler, white-tailed deer, and elk.
- WLF-DC-02** Permanent grass, forb, and shrub openings are positioned within forested habitats to ensure nesting and foraging areas are within proximity of each other for many animals. These openings are located to minimize conflict with recreationists and to ensure streams and native plant communities near these openings are not affected (i.e., stream temperature and channel integrity are not negatively affected). These areas are important to the life histories of many wildlife species but especially to bobwhite quail, wild turkey, white-tailed deer, elk, black bear, golden-winged warblers, and many other birds, bats, and pollinators.
- WLF-DC-03** Unfragmented interior forest conditions continue to occur across the landscape. The distribution may change as the forest ages or management actions occur.
- WLF-DC-04** Mature forests, including late seral stages and old growth conditions, provide habitat and forage for species such as black bear, wild turkey, white-tailed deer, cerulean warbler, wood thrush, other species of migratory and resident birds, terrestrial salamanders, bats, and reptiles.
- WLF-DC-05** Woodlands and other open forest types provide open understory conditions across all elevations that enhance nesting and foraging opportunities for many bird and bat species, suitable areas for butterflies, bees, and other pollinators, as well as optimal foraging for browsers such as white-tailed deer and elk. Larger native trees with exfoliating bark provide roosting habitat for bats.

**Table 3. Terrestrial Wildlife Habitat Conditions Across Ecozones**

Habitat	Characteristics	Approximate acres needed over many planning cycles <sup>10</sup>	Associated Species
Young Forests, (including early successional conditions)	Canopy openings across a range of sizes depending on ecozone, management area, and species of interest.  In open grassy, herbaceous, and shrubby areas, average opening size is greater than or equal to five acres (larger openings may be needed to support golden-winged warbler)	60-90K (70% above 2500')  This includes approximately 5,200 acres in permanent open grassy, herbaceous, and shrubby areas and mountain balds	Nesting and foraging habitat for animal species such as pollinators, ruffed grouse, wild turkey, bobwhite quail, American woodcock, golden-winged warbler, white-tailed deer, elk, bats, and various songbirds
Open Forest Condition	Canopy density approximately 40-60%; grassy, herbaceous, or shrubby understory	360-480K	Nesting, roosting, and foraging habitat for animal species such as pollinators, ruffed grouse, wild turkey, white-tailed deer, bobwhite quail, American woodcock, elk, bats, black bear, and various songbirds
Interior Forest Condition	Continuous tracts of forest in mature and late seral stages that are unfragmented by edge forest conditions	500-600K	Foraging habitat and cover for animal species such as terrestrial salamanders and migratory birds; denning habitat for black bear; and bat roosting and foraging. These areas also support high plant diversity
Mature Forests (includes late seral stages and old growth forest)	Larger canopy trees dominate; range of understory conditions	565-730K  This includes 430-560K old growth	Nesting and foraging habitat for animal species such as terrestrial salamanders, cerulean warbler, and wood thrush; denning habitat for black bear; bat roosting and foraging

<sup>10</sup> Approximate numbers of acres were informed by the NRV modeling of separate ecozones but are not a forestwide target, or objective in and of themselves. Further, the Plan EIS demonstrates that some of these acreages may not be attainable in modern times because landscape conditions have changed from NRV. See the EIS for specifics.

**WLF-DC-06** Habitat components at finer scales provide for wildlife occupancy, are present in sufficient amounts, and distributed across all ecozones. For example, snags provide roosting and nesting habitat for bats and cavity nesting birds, especially along the edge of openings, and foraging habitat for insectivores such as woodpeckers. Larger diameter live or dead trees provide habitat for black bear and other species requiring cavity or denning conditions, while smaller live or dead trees with crevices provide critical nesting and roosting habitat for flying squirrels and bats. Coarse wood on the forest floor, in a variety of sizes and shapes, provides habitat for salamanders and other cover and moisture-associated wildlife, nesting areas for some migratory birds (e.g., black and white warbler), as well as drumming logs for ruffed grouse.

These habitat components that are retained during young forest restoration perpetuate to later successional stage, either through natural succession or through forest stand improvement practices. Over time, they contribute to the development of old growth characteristics such as large, downed woody debris; abundant snags; variable gap sizes; and tip up mounds.

Table 4 provides desired amounts of finer scale habitat components retained during young forest restoration.

**Table 4. Finer-Scale Habitat Desired Conditions for Young Forests**

Snags	Den Trees	Coarse Woody Debris
An average of at least 4 snags/ac greater than 9" DBH is present within young forest habitats across the forest, including naturally-occurring and those created incidentally or intentionally during restoration activities. In areas known to be or potentially occupied by federally listed bats, snag recruitment and retention should also include snags $\geq 3"$ DBH.	Trees greater than 9" DBH exhibiting crevices and other suitable denning characteristics are present across the landscape.	Density will vary by surrounding forest type and age, but some pieces of downed wood that are at least 10" in diameter and at least 10' long are present on the forest floor across the landscape.

**WLF-DC-07** Edge and transitional habitats are finer scaled ecotones that are provided in amounts and locations for species' persistence and overall wildlife diversity. These ecotones serve as a transition between ecosystems or habitats and usually support higher plant and animal diversity.

**WLF-DC-08** Adjacent habitat types are provided in arrangements to support species' complete life histories. For example, wild turkey require open grassy areas for nesting and foraging, shrubby areas for cover and forested areas for roosting. White-tailed deer require open or grassy areas for browsing and mature forest for mast production critical to foraging success. Golden-winged warblers require open grassy and herbaceous areas with shrubby inclusions adjacent to mature forest.

Desired conditions for a hard mast component are identified as a key characteristic in appropriate ecozones (See Table 2). Additionally, soft mast, in the form of fruit and berries, is available in sufficient quantities across all ecozones. Hard and soft mast

quality and quantity is vital to many animal species, including wild turkey, white-tailed deer, black bear, and migratory birds, such as cedar waxwings and thrushes.

**WLF-DC-09** Habitats across the Forests are diverse and support populations of game species such as ruffed grouse, black bear, white-tailed deer, and wild turkey. Habitats are distributed across the Forests to provide opportunities for hunters to harvest game species at sustainable levels.

**WLF-DC-10** Elk habitat conditions for North Carolina's expanding elk herd are provided within NCWRC's Elk focal area.

## Objectives

See Integrated Ecosystem and Wildlife Habitat Objectives.

## Standards

- WLF-S-01** When identifying wildlife habitat diversity elements for retention during vegetation management activities:
- i. Maintain an average of four snags ( $\geq 9"$  DBH) per acre across the project area to contribute to landscape scale wildlife habitat diversity for species such as bats, woodpeckers, and other cavity nesting birds, except where such snags pose a threat to human health or safety. Retain snags exhibiting suitable wildlife habitat characteristics (e.g., exfoliating or sloughing bark, cavities, or crevices) along the edge of openings or combined with other leave trees to extend the life of ephemeral wildlife habitat elements in the project area and reduce threats to human health and safety during vegetation management activities. To minimize the risk of incidental take, in areas known to be or potentially occupied by federally listed bats, snag recruitment and retention should also include snags or live trees with more than 25% exfoliating bark  $\geq 3"$  DBH.
  - ii. Emphasize hard and soft mast producing species, including mast-bearing trees, berries, and fruit trees, to enhance foraging opportunities for species such as white-tailed deer, wild turkey, ruffed grouse, black bear, song birds, and small mammals.
  - iii. Emphasize the following:
    - Native trees with exfoliating bark and natural crevices, including, but not limited to, shagbark hickory, white oaks, yellow pines, yellow birch, and black locust, to provide roosting and denning habitat for bats and Carolina northern flying squirrels. Consider current research, such as United States Fish and Wildlife Service (USFWS), NCWRC, North Carolina Bat Working Group (NCBWG), the USFS bat conservation strategy, or other relevant guidance to determine appropriate roost and den tree species and condition for retention during project implementation.
    - Whenever possible, snags susceptible to windthrow should be identified in clumps and/or buffered by live trees.

- Standing live and dead trees >9" DBH that exhibit cavities and other denning conditions, except where human safety is of concern.
- Live eastern hemlock where possible to preserve the gene pool and food source for birds and small mammals.

- iv. Emphasize retention of downed woody debris of various sizes, where available, and include pieces that are at least 10" DBH and 10' long to provide habitat for salamanders and other cover- and moisture-associated wildlife and drumming logs for ruffed grouse. Consider leaving new logging slash.

**WLF-S-02** Use native plant material in wildlife openings and other wildlife habitat enhancements unless the non-native material is not invasive and is desired for a historical, wildlife, or other identified resource benefit.

**WLF-S-03** Do not remove beavers or beaver dams except when needed to protect critical values such as existing infrastructure or public health and safety. Trapping, as defined and regulated by the North Carolina Wildlife Resources Commission, is allowed.

## Guidelines

**WLF-G-01** Existing open grassy areas should be managed to provide adjacent shrub/sapling habitats, where practical, to benefit species requiring these conditions in proximity to each other, such as ruffed grouse, wild turkey, and golden-winged warblers.

**WLF-G-02** Open understory conditions should be enhanced to provide the natural range of variation through a reduction in ericaceous shrubs, such as deciduous azaleas and mountain laurel, to benefit many species of birds, bats, and other animals.

**WLF-G-03** To minimize hybridization between golden-winged warbler (GWWA) and blue-winged warblers (BWWA), management activities between 2,500' and 3,000' elevation should be designed to avoid colonization by BWWA. Coordination with the NCWRC and USFWS should be a part of this process during project implementation.

**WLF-G-04** Native nectaring and host plants should be incorporated into plantings and seed mixes to enhance pollinator opportunities.

"Irregular" forest edges (i.e., not straight) and vegetation transition (i.e., open area to brushy area to forest) should be emphasized during vegetation management projects to maximize structural diversity in smaller landscapes for wildlife species depending on a variety of habitats in proximity to each other such as ruffed grouse, golden-winged warbler, and black bear. The degree to which this is applied will depend on project-level restoration objectives for compositional and structural restoration and the applicable tools to achieve them.

## Integrated Ecosystem and Wildlife Habitat Objectives

Some of these objectives have integrated management approaches that apply to multiple objectives. Therefore, in addition to management approaches listed under each objective, see the Integrated Ecosystem and Wildlife Habitat Management Approaches for the objectives below.

**ECO-O-01** Tier 1: Over the life of the plan, maintain 3,750 acres of **existing grass, forb, and shrub** openings.

Tier 2: Over the life of the plan, restore 1,450 acres of grass, forb and shrub openings that are not currently present on the Forests.

**ECO-O-02** Tier 1: Increase **new young forest** conditions by using silvicultural practices on between 650 to 1,200 acres annually.

Tier 2: Increase new young forest conditions by using silvicultural practices on between 1,200 to 3,200 acres annually.

*Management approach: Young forest creation will be accomplished using both timber harvest and prescribed fire. Timber harvest will account for most (approximately 80% or more) of young forest creation during the life of the plan.*

**ECO-O-03** Tier 1: Conduct **stand and forest community improvement practices** on between 3,800 acres to approximately 6,000 acres annually.

Tier 2: Conduct stand and forest community improvement practices on between 6,000 acres to approximately 12,000 acres annually.

*Management approach: This objective includes mechanical and chemical site preparation and release treatments in seedling and sapling stands across all disturbance types. It also includes midstory treatments to assist with developing advanced competitive regeneration and treatments to improve ecosystem composition and density.*

**ECO-O-04** Tier 1: Annually apply **intermediate thinning treatments** on 150 to 400 acres to address forest health, future composition, and structure desired conditions.

Tier 2: Annually apply intermediate thinning treatments on 400 to 600 acres to address forest health, future composition, and structure desired conditions.

**ECO-O-05** Tier 1: Annually thin and burn 300 to 600 acres to advance **open forest woodland conditions**.

Tier 2: Annually thin and burn 600 to 900 acres to advance open forest woodland conditions.

*Management approach: Open forest woodland conditions are restored and maintained using a combination of both timber harvest and prescribed fire and both commercial and non-commercial treatments. This will include regeneration in a portion of the woodland during the maintenance phase. The maintenance phase requires repeated prescribed fire treatments.*

**ECO-O-06** Tier 1: Apply **prescribed fire** on 10,000 acres to 20,000 acres annually to restore and maintain fire adapted ecozones, create woodlands, and reduce hazardous fuels.

Tier 2: Apply prescribed fire on 20,000 acres to 45,000 acres annually to restore and maintain fire adapted ecozones, create woodlands, and reduce hazardous fuels.

*Management approach: Annually, determine a planned level of prescribed fire based on resource availability, weather conditions, and other factors. The priority fire adapted ecozones include shortleaf pine, pine-oak/heath, dry oak, and dry mesic oak ecozones. Prescribed fire would be prioritized where federally listed and SCC species habitat require frequent burning.*

- ECO-O-07** Tier 1: Restore 50 acres of **spruce fir ecozones** annually to improve ecozone composition.

**See also:** Objectives in Plant and Animal Diversity, Old Growth Network, and Forest Health

### Integrated Ecosystem and Wildlife Habitat Management Approaches

Across multiple objectives shown above, vegetation management activities, including but not limited to timber harvest and fire management, will emphasize ecosystem restoration (as reflected in forestwide desired conditions) and maintaining existing silvicultural investments. Use geographic area goals, compositional and structural departure results, or monitoring reports to aid in the identification of vegetation management opportunities.

- Restore ecological systems to their natural composition, structure, and function based on the ecological potential of the site, potential natural vegetation, and predicted impacts of climate change. Restoration priorities include:
  - Ecosystem Moisture Class: Xeric (shortleaf pine, pine oak heath, dry oak)
    - Creating woodland structure through thinning and prescribed fire in the shortleaf pine/oak, pine/oak heath, and dry oak ecozones. Cluster planting desirable species in a subset of gaps.
    - Restoration of dry oak ecozone tree species through removal of off-site white pine and prescribed fire.
    - Restoration of shortleaf pine-oak ecozone, including removal of off-site white pine, with prescribed fire and, where necessary, planting and release.
  - Ecosystem moisture class: Moderate (mesic oak, dry-mesic oak, high elevation red oak)
    - Removal of white pine and tulip poplar combined with prescribed fire and subsequent release of desired canopy tree species.
    - Performing mid-story treatments to reduce mesic species sprouting across oak ecozones and, where possible, in combination with prescribed fire.
    - Improve the success of oak regeneration by timing treatments to take advantage of competitive regeneration presence. Within oak-dominated ecozones, transition away from treatments that do not coincide with or enhance oak regeneration in the understory or do not create light conditions favorable for oak development.
    - Design regeneration treatments to build well-distributed advanced oak regeneration across large landscapes (typically 100 acres or more). Given the short window associated with acorn availability, treatments need to be responsive to acorn production, fast to implement, and may include activities like mid-story reduction and use of prescribed fire.
  - Ecosystem Moisture Class: Mesic (acidic cove, rich cove, northern hardwoods, spruce fir, floodplain forests)
    - Underplanting red spruce and Fraser fir and their subsequent release within the spruce/fir ecozone.

- Thinning or group selection within dense red spruce plantations and natural stands to facilitate natural regeneration, species diversity, and complex stand structures.
- Due to elevation, sites available for red spruce and Fraser fir restoration may occur in management areas that limit active management (e.g., IRAs, WSA, Wilderness, etc.). Efforts to restore these two high elevation conifer species should continue to be pursued where ecologically appropriate as their restoration is beneficial to conditions regardless of management area designation.
- Harvesting white pine from white pine dominated coves and supplemental planting of cove hardwood species where needed.
- Harvesting poplar from poplar dominated coves with a low-quality herb layer with follow up treatments to promote desirable species composition.
- Wildlife Habitat Diversity:
  - Prioritize at least 70% of young forest treatment units (including regeneration harvest) above 2,500 feet in elevation to enhance habitat for ruffed grouse, golden-winged warblers, and others to contribute to healthy populations on the Forests.
  - Prioritize at least 50% of young forest treatment units (including regeneration harvest) in oak-dominated, northern hardwood, and rich cove ecozones, emphasizing unit sizes appropriate to enhance and restore habitat for species such as ruffed grouse.
  - Develop 50% of young forest conditions (ECO-O-02) and open forest woodland conditions (ECO-O-03) within NCWRC Wildlife Habitat Active Management Areas (WHAMAs) focal areas using a variety of silvicultural tools, including prescribed burning. Ensure these conditions provide for elk habitat when activities are within its currently occupied range or within the NCWRC elk focal area.
  - When prescribing management within WHAMAs for golden-winged warbler and cerulean warbler, follow recommended best management practices for these species.
  - Design treatments that are sensitive to or enhance unique biological features, especially within Natural Heritage Natural Areas (NHNA's).
  - When restoring existing wildlife openings or when planning for new ones, prioritize openings in old pine plantations and other areas of monoculture forest, considering site productivity and habitat needs.
  - Coordinate with the NCWRC and USFWS on treatments for wildlife habitat diversity.
- For all vegetation management and prescribed fire activities:
  - Treatments around concentrated recreation sites will consider the recreation values and visitor safety of the areas.



- Culture partnerships and collaborative groups to identify, guide, and implement restoration projects. The engagement of partner and collaborative input is important to developing successful, well supported multi-resource management projects.
- Utilize capacity tools, such as the Good Neighbor Authority, to partner with the North Carolina Wildlife Resources Commission, the North Carolina Forest Service, and other organizations and partners to increase restoration capacity. Utilize Stewardship Agreements with partners to increase restoration-based habitat management projects.
- Support the trial or adoption of forest product certification standards as they become available for use in the National Forest System, such as, but not limited to, Forest Stewardship Council and Sustainable Forestry Initiative certification.

## Plant and Animal Diversity

Ecological and habitat conditions on the Nantahala and Pisgah NFs contribute to the recovery of federally threatened and endangered (T&E) species, provide conditions for the long term persistence of SCC and contribute to overall habitat diversity.

The approach for providing plant and animal diversity across the Forests requires both a coarse-filter and fine-filter. The coarse filter identifies conditions to maintain or restore ecological integrity and resilience of ecosystems, and by doing so, should account for the needs of most native species that occur on the forest. The fine filter provides for specific habitat needs that are not met by the coarse filter. The Terrestrial Ecosystem section above primarily serves as the coarse filter of the plan in that it identifies plan direction to meet the needs of ecosystems and most species. The Plant and Animal Diversity section primarily serves as the fine filter in that it focuses on plan components that meet needs of specific species or species groups where their needs are not covered by the coarse filter alone.

The section begins with a discussion of **T&E species**, identifying the proposed, endangered, and threatened (PET) species are known to occur on the Forests and additional species whose ranges occur within the National Forests. In accordance with the Endangered Species Act, in areas occupied by federally listed species and/or identified as designated critical habitat, management will maintain characteristics required by these species. The USFS will coordinate with U.S. Fish and Wildlife Service to increase the population size and enhance or restore suitable habitat for federally listed species on the Forests and within Western North Carolina.

Next the section describes the **species groups** found on the Forests, and the **unique habitats** found here.

Within this section, the plan includes direction on managing in North Carolina Natural Heritage Natural Areas located on the Nantahala and Pisgah NFs. The North Carolina Natural Heritage Program (hereafter “Heritage Program”) is administered by the state of North Carolina to complete a systematic inventory of elements of natural diversity that exemplify the state’s natural heritage. Across the state, the Heritage Program has identified North Carolina NHNAs as areas with either rare terrestrial or aquatic species, unique natural communities, important animal assemblages, or other unique ecological features. Not all NHNAs possess the same caliber of unique ecological characteristics, and the Heritage Program ranks NHNAs on a scale from general to exceptional. The Forest Service will work with the Heritage Program to discuss the values inventoried and locations of unique characteristics during planning and implementation for projects in and adjacent to NHNAs.

Many of the most exceptional sites have been allocated to the “Special Interest Areas” management area (see chapter 4).

The Forests’ SCC list contains species, other than federally recognized threatened, endangered, proposed, or candidate species, that are known to occur on the Forests and for which the regional forester has determined there is substantial concern about the species’ capability to persist over the long-term in the plan area. The list of these species is contained outside the forest plan so that it can be updated as information changes. Forest management will maintain viable populations and habitat for these species at the forest scale.

### Desired Conditions

- PAD-DC-01** Habitats are consistent with recovery plans and Biological Opinions for federally listed and proposed species in order to contribute to recovery of these species.

**Table 5. Threatened or Endangered Species, Status, and Contributions to Species Recovery**

Species	Status	Nantahala and Pisgah Contributions to Species Recovery (Terrestrial Animals)
Rusty-patched bumblebee <i>Bombus affinis</i>	E	Document presence (or confirm absence) of species across the NP.
Virginia Big-eared Bat <i>(Corynorhinus townsendii virginianus)</i>	E	Document presence (or confirm absence) of species across the NP.
Carolina Northern Flying Squirrel <i>(Glaucmys sabrinus coloratus)</i>	E	Maintain species presence within currently occupied habitat on the NP.
Spruce-fir Moss Spider <i>(Microhexura montivaga)</i>	E	Maintain species presence within currently occupied habitat on the NP.
Gray Bat <i>(Myotis grisescens)</i>	E	Maintain species presence within currently occupied habitat on the NP.
Northern Long-eared Bat <i>(Myotis septentrionalis)</i>	T (4d)	Maintain species presence within currently occupied habitat on the NP. Protect summer maternity habitat consistent with the most recent recovery plan or Biological Opinion for the species.
Indiana Bat <i>(Myotis sodalis)</i>	E	Maintain species presence within currently occupied habitat on the NP. Protect summer maternity habitat consistent with the most recent recovery plan or Biological Opinion for the species.
Noonday Globe <i>(Patera clarki nantahala)</i>	T	Maintain species presence within currently occupied habitat on the NP.

Species	Status	Nantahala and Pisgah Contributions to Species Recovery (Aquatic)
Appalachian Elktoe <i>(Alasmidonta raveneliana)</i>	E	Maintain species presence within currently occupied habitat on the NP.
Little-wing Pearlymussel <i>(Pegius fabula)</i>	E	Maintain species presence within currently occupied habitat on the NP.
Spotfin Chub <i>(Erimonax monachus)</i>	T	Maintain species presence within currently occupied habitat on the NP.

Species	Status	Nantahala and Pisgah Contributions to Species Recovery (Terrestrial Plants)
Cliff Avens ( <i>Geum radiatum</i> )	E	Minimize any impact from human uses and woody encroachment at or near two known populations and subpopulations. Continue to document population change in long-term demographic plots.
Rock Gnome Lichen ( <i>Gymnoderma lineare</i> )	E	Minimize any impacts from human uses at and near the population locations in high elevation rock outcrops, spray cliffs or streams. Document population stability to help assess need for endangered species status.
Mountain Bluet ( <i>Hedyotis purpurea</i> var. <i>montana</i> )	E	Maintain open habitat conditions in high elevation rocky summits at and near the four existing populations. Reduce impacts from recreational use and consider augmentation at one site.
Bunched Arrowhead ( <i>Sagittaria fasciculata</i> )	E	Maintain open cold-water habitat in low elevation streams and bogs to provide suitable habitat for potential occupancy.
Mountain Sweet Pitcher Plant ( <i>Sarracenia rubra</i> ssp. <i>jonesii</i> )	E	Maintain open habitat in Southern Appalachian bogs to provide suitable habitat for potential occupancy.
Swamp Pink ( <i>Helonias bullata</i> )	T	Control non-native invasive plant species and reduce woody encroachment, and maintain hydrologic flows of the bogs and swamp forest where the one existing population occurs on National Forest.
Mountain Golden Heather ( <i>Hudsonia montana</i> )	T	Manage for open habitat conditions on rock outcrops and restrict impacts from human uses.
Small Whorled Pogonia ( <i>Isotria medeoloides</i> )	T	Reduce mid-story and provide more open canopy conditions in mid-succession forests at and near the one remaining population in order to restore the vigor of this population.
Heller's Blazing Star ( <i>Liatris helleri</i> )	T	Maintain the habitat in rock outcrops for the four existing populations by reducing impacts from human uses.
Blue Ridge Goldenrod ( <i>Solidago spithamea</i> )	T	Reduce woody encroachment and impacts from recreational use around the two populations on NF land in high elevation rocky summits in order to increase individuals. Introduce one new population on a suitable site approximately two miles from the existing population in order to increase redundancy.
Virginia Spiraea ( <i>Spiraea virginiana</i> )	T	Control non-native invasive plant species and allow adjacent river streamside scour at and near the three existing populations in order to maintain open suitable habitat.

- PAD-DC-02** Rare terrestrial habitats occur at natural distribution patterns; are affected primarily by natural disturbances (or restoration activities mimic natural disturbances); have an informed public about protections of unique habitats; and impacts from recreation use are reduced.
- PAD-DC-03** Unique habitats support plant and wildlife species dependent on associated habitat characteristics and are resilient in the face of change.
- PAD-DC-04** North Carolina NHNAs, which support important populations of rare species and high-quality natural communities, contribute to the goal of maintaining and restoring biodiversity across the Forests.
- PAD-DC-05** The FS partners with NCNHP, NCWRC, and USFWS in the identification of plant and animal species and their associated habitat needs, proactively working to maintain, enhance, and restore plant and animal diversity.
- PAD-DC-06** Desired conditions for canopy cover and shrub and herbaceous cover of unique habitats are shown in Table 6. These conditions may also be enhanced by active management techniques.

**Table 6. Desired Conditions of Unique Habitats**

Unique Habitat	Desired Conditions for Canopy Cover (Other Primary Characteristics)	Desired Conditions for Shrub and/or Herbaceous Cover
Grassy Balds	Less than 25% canopy cover	50% native grasses and shrubs; less than 15% blackberry ( <i>Rubus canadensis</i> ) cover; grassy bald subtype has less than 25% shrub cover; alder bald subtype has greater than 50% green alder shrub cover
Heath Balds	Free of trees	Densely covered with shrubs
Beech Gap	Dominated by wind-swept short height beech; beech trees produce seedlings and saplings within the understory layer	Pennsylvania sedge-dominated understory layer
Boulderfield	Diversity of canopy tree species, including yellow birch, sugar maple, and buckeye, with greater than 80% total coverage	Mosaic of different boulder shapes and sizes occur with at least 30% covered by moss; habitat for a diverse group of herbaceous, moss, liverwort, and lichen species exists
High Elevation Rocky Summits	Less than 10% canopy cover	Less than 20% shrub coverage; provides habitat for a diversity of rock-adapted herbaceous species
High Elevation Granitic Domes	Less than 10% canopy cover, Appalachian ragwort ( <i>Packera anonyma</i> ) is not present and does not result in hybridization with divided leaf ragwort	Less than 30% shrub coverage; greater than 30% coverage by twisted hair spikemoss; habitat for a diversity of rock adapted herbaceous, moss, liverwort, and lichen species exists

Unique Habitat	Desired Conditions for Canopy Cover (Other Primary Characteristics)	Desired Conditions for Shrub and/or Herbaceous Cover
Low Elevation Granitic Domes	Less than 30% canopy cover	Less than 30% shrub coverage, greater than 20% coverage by rock spikemoss; habitat for a diversity of rock adapted herbaceous, moss, liverwort, and lichen species exists
Montane Cliffs	Acidic, basic, and mafic types are variable in size, from ½ acre to >2 acres, and have canopy trees only on their periphery	Habitat for a diverse group of herbaceous, moss, liverwort, and lichen species exists
Low Elevation Rocky Summits	Open habitats with widely dispersed trees providing less than 10% canopy cover	Less than 20% shrub cover greater than one meter in height is present; habitat for a diversity of low growing subshrubs and herbaceous species exists
Carolina Hemlock Bluff/Forest	Carolina hemlock provides at least 40% canopy cover and is regenerating	Variable depending on subtype; dominant Carolina hemlock with dense ericaceous shrub layer and few herbs, where co-dominant with pitch and/or Table Mountain pine patchy shrub layer with diverse herbs including grasses, forest type with dense mesic evergreen shrubs and low herb diversity
Rocky White Pine Forest	60% white pine cover; occur on steep slopes (typically greater than 50%) in sheltered gorges; white pine regenerating in the understory	Dense shrub layer
Calcareous Oak-Walnut Forest	Less than 70% total canopy cover; chinquapin oak, red oak, and black walnut are regenerating; wildland fires occur every 7-12 years to support open woodland conditions	Patchy shrubs with fire adapted herbs and grasses
Serpentine Woodlands (Barrens)	Less than 60% total canopy cover; pitch pine and white oak are regenerating; wildland fires occur every 7-12 years to support open woodland conditions	Greater than 50% grass cover
Red Cedar/Shale Woodlands	Less than 70% total canopy cover that includes greater than 30% red cedar; red cedar is regenerating	Patchy shrubs with over 50% grass coverage dispersed between rock faces

Unique Habitat	Desired Conditions for Canopy Cover (Other Primary Characteristics)	Desired Conditions for Shrub and/or Herbaceous Cover
Unique or Rare Habitat	Three subtypes depending on whether dominated by grasses, sedges, or herbs.	Greater than 40% grasses and/or spike moss coverage
Low Elevation Glade	Open canopy structure (<30% canopy cover)	
Upland/Vernal Pool	Seasonally saturated; shallow water depth	Free of woody plants and has associated herbaceous species
Southern Appalachian Bogs	Less than 20% canopy cover	25% cover that includes suitable habitat for associated herbaceous and woody plant species, abundant Sphagnum moss
Swamp Forest Bog Complex	Closed canopy with small gaps up to ¼ acre in size	50% cover of Sphagnum mosses, grasses, and/or sedges
Seeps	Typically less than 1/10 of an acre; permanently saturated wetlands generally embedded within the streamside zone, trees rooted on edge	Patchy to less than 30% shrub cover, herbaceous coverage greater than 50%
Spray Cliff	Sediment free, typically treeless	Herbaceous and bryophyte coverage greater than 50%
Floodplain Pool	Present during periodic naturally occurring flooding events	Few emergent herbaceous species; short-lived annuals, biennials, and herbaceous species on periphery
Rocky Bar and Shore	Occur along naturally functioning floodplains, typically treeless	Densely covered with shrubs or herbaceous species, based on the frequency of flooding
Caves/Mines	Not trampled or impacted by recreationists, habitat free from white nose syndrome for a diversity of bats. Caves/mines retain characteristics important to bats (e.g., microclimate, airflow) and are surrounded by healthy forests providing quality spring staging and fall swarming habitat.	

\*Wildland fire includes wildfires and prescribed fires

## Objectives

- PAD-O-01** Tier 1: Restore and maintain 11-23 **glades and barrens** to a woodland or open structural condition, over the life of the plan.

- PAD-O-02** Tier 1: Maintain all **Carolina hemlock** bluff sites (approx. 40 sites) to ensure that Carolina hemlocks are reproducing with minimal impact from hemlock woolly adelgid, over the life of the plan.
- PAD-O-03** Tier 1: Restore and/or maintain at least 12 Southern Appalachian **bogs** by reducing woody plant encroachment, over the life of the plan.
- PAD-O-04** Tier 1: Maintain or restore 10-20 acres of existing grassy **balds** across the Forests, outside of Roan Mountain, over the life of the plan. Across these habitat boundaries, maintain a variable size shrub or heath bald. (See also the separate bald objective for Roan Mountain: RM-O-01).
- PAD-O-05** Tier 1: Manage and restore *Hudsonia montana* and *Liatrix helleri* populations to ensure competing woody plants do not overtop and impact either species.

### Standards applicable to all species groups

- PAD-S-01** Continue to work with the USFWS to expand known range, increase the population size, and enhance/restore suitable habitat for federally listed species on the Forests and within western North Carolina.
- PAD-S-02** In areas occupied by federally listed species and species of conservation concern, management shall maintain characteristics required by these species, where necessary for their recovery and/or persistence.
- PAD-S-03** Do not issue permits for collection of federally listed species or SCC except for approved scientific purposes and after coordinating with the USFWS.
- PAD-S-04** Project-level field surveys for population and habitat of federally listed species or SCC shall be commensurate with the risk of potential activities, using the following consistent and efficient approach.

Field surveys may not be conducted if any of the following are true and are documented in the project record:

- Proposed activities will not affect species or their habitats, or will have beneficial effects, or
- Adequate inventory following accepted protocols is available that can be used, or
- Information on number and location of individuals or habitat conditions would not allow better assessment of effects to the population or improve design or mitigations more than assuming presence and analyzing expected effects.

Field surveys shall be conducted when all of the following conditions are met:

- The proposed treatment area has a potential for occupancy, and
- Project activities may affect the population or habitat of a federally listed species or SCC, and
- Adequate population inventory information is unavailable, and
- Information on number and location of individuals and habitat conditions would improve project design, the application of mitigations to reduce adverse effects, or the assessment of effects of the population.



### Guidelines applicable to all species groups

- PAD-G-01** Work with USFWS to ensure that recovery plans and relevant biological opinion guidance for federally listed species are incorporated into project design and implementation. Consider newer information from USFWS five-year reviews when relevant.
- PAD-G-02** When NHNAs are present within an analysis area, coordination should occur with the NC Natural Heritage Program early during project development to discuss the unique ecological values present, their locations, the representativeness and quality of these values, and potential management treatments. Project proposal development should consider opportunities to maintain or restore unique values. Field review may be necessary.

### Management approaches applicable to all species groups

Continue to work with partners to increase the population size and enhance or restore suitable habitat for federally listed species on the Forests and within western North Carolina.

Maintain and periodically update a science-based list of habitats associated with SCC and federally listed species. Use this list to help determine the need for fine filter or coarse filter management including protection.

Species management activities are done in coordination with the USFWS, NCWRC, and the NC Heritage Program.

Work with user groups on collaboration, stewardship, and education to maintain the integrity and resiliency of rare plant communities through site-specific actions.

Consider the North Carolina Wildlife Action Plan when implementing activities for habitat and wildlife management, including priority amphibian and reptile conservation areas.

Regularly coordinate with the State Natural Heritage Program regarding newly inventoried locations and proposed changes to the Heritage Program's state registry including refinement of area boundaries to reflect new information about species and rare communities.

Coordinate with the NC Natural Heritage Program early during the development of projects as well as on out year activities and potential partnership opportunities to improve NHNA conditions. Active management techniques may occur within NHNAs such as, but not limited to, prescribed burning, vegetation management including commercial timber sales and non-commercial improvement practices, and non-native invasive species treatments.

Prioritize non-native invasive species treatments in Natural Areas and emphasize pre-treatment prior to management activities.

### Rocky Habitats – Standards

- PAD-S-05** Manage recreational impacts to *Hudsonia montana* and *Liatris helleri* within Linville Gorge Wilderness to protect the species. (See also REC-S-19)
- PAD-S-06** Manage human activities and other nest disturbing activities in the vicinity of active peregrine falcon nesting sites during nesting season to control human disturbance and encourage successful nesting and fledging. Base seasonal closures on monitoring and nesting activity.

- PAD-S-07** Remove or relocate travel ways from boulderfields known to support species such as the Allegheny woodrat and timber rattlesnake to minimize disturbance of suitable habitat features. Do not construct new trails across these features unless species at risk are confirmed to be absent.
- PAD-S-08** Maintain habitat characteristics required by plant and animal species occupying boulderfields, low and high elevation rocky summits, granitic domes, glades, or cliffs during project design and implementation.

### **Rocky Habitats – Management Approaches**

Collaborate with the climbing and recreational community on peregrine monitoring and seasonal closures.

### **Federally Listed Bats – Standards**

- PAD-S-09** Coordinate with the USFWS to ensure that protection of potential and known habitat is consistent with the most recent conservation measures, recovery plans, biological opinions or USFS bat conservation strategy. This includes delineating appropriate fall swarming and spring emergence buffers and applying appropriate conservation measures (e.g. activity type, timing, etc.).
- PAD-S-10** Identify caves, abandoned mines, and large rock shelters supporting bat populations as smoke-sensitive targets where and when bats are present.
- PAD-S-11** Post and enforce the regional cave and abandoned mine closure order at all biologically significant caves and other known bat hibernacula (e.g., abandoned mines, large rock shelters, talus slopes, cliff faces) to control human disturbance and prevent the spread of white-nose syndrome in cave-associated bats, including, but not limited to, the federally-endangered Indiana bat and threatened northern long-eared bat.
- PAD-S-12** If cave and mine closure orders are found to be ineffective at protecting hibernating bats from human disturbance, construct and maintain gates or other structures that allow for entrance and egress by bats.
- PAD-S-13** Follow all USFWS direction concerning mitigation efforts for the effects of white-nose syndrome on susceptible bat species, including decontamination protocols for people permitted to enter caves and mines for purposes identified in the closure.

### **Bald and Golden Eagles – Standards**

- PAD-S-14** Delineate and maintain protection zones around known bald and golden eagle nesting and communal roosting sites until such sites are no longer occupied or suitable as established in the Bald and Golden Eagle Protection Act and USFWS supporting documents.

### **Green Salamander – Standards**

- PAD-S-15** Within the documented range of green salamanders, shaded rocks greater than 36 square feet in size shall be surveyed for species' presence during project-level planning. These surveys shall occur prior to project design to inform project implementation. If present, project activities shall be designed to avoid direct and indirect disturbance of the species and habitat, to protect thermal and moisture characteristics of the rocks

(e.g., when appropriate, identification of a 300 foot no canopy tree removal buffer or other mitigations) and provide for habitat connectivity and dispersal. If the rocks are determined to be unoccupied, design activities to maintain suitable habitat.

### **Spruce Fir Moss Spider and Rock Gnome Lichen – Standards**

- PAD-S-16** Within spruce-fir and northern hardwood forests, maintain a 100' canopy tree buffer around rock outcrops and boulders in appropriate habitat for spruce-fir moss spider and rock gnome lichen. If structural or compositional restoration needs are identified within this area, appropriate field surveys and consultation with the USFWS to design and implement projects to meet multiple objectives shall be conducted.

### **Carolina Northern Flying Squirrel – Management Approaches**

When removing trees within CNFS habitat (spruce-fir and northern hardwood ecozones), and where human health and safety will not be affected, consider the use of girdling or herbicides to recruit future potential den trees, especially trees  $\geq 8"$  dbh.

Avoid tree felling during CNFS breeding season approximately March to August.

Avoid felling hemlock, spruce, and fir in CNFS habitat. Also avoid felling yellow birch in CNFS habitat where yellow birch is limited.

## Designated Old Growth Network

### Background

The U.S. Department of Agriculture, Forest Service, Southern Region, recognizes old-growth forests as a valuable natural resource worthy of protection, restoration, and management. Old-growth forests provide a variety of values, such as biological diversity, wildlife habitat, recreation, esthetics, soil productivity, water quality, aquatic habitat, cultural values, and high-value timber products. Old-growth communities are rare or largely absent in the southeastern forests of the United States; however, an extensive amount of the Nantahala and Pisgah National Forests is trending toward old growth conditions. This trend provides an opportunity to ensure that current and future old growth is protected to meet the diverse values that it provides. Forest species can depend on one or more characteristics of older forests during their life history. Some lichens, for example, depend on large trees and structural components within old-growth forests.

Old growth forests are characterized by old trees and related structural attributes. Old growth encompasses the later stages of stand development that typically differ from earlier stages in a variety of characteristics including tree size, accumulation of large dead woody material, number of canopy layers, species composition, degree of soil disturbance, and ecosystem function. Old growth is not necessarily virgin or primeval. It can develop over time following human disturbances, as it does following natural disturbances.

The process of ensuring old growth forests develop on the landscape requires long term planning and management for old growth characteristics. This forest plan accounts for that long term strategy by designating a network of large, medium, and small old growth forest patches that will either perpetuate or evolve towards old growth conditions over time. These patches are not limited to current old growth but include lands that will become old growth over time. The designated old growth patches occur in multiple management areas. Should disturbance occur such that a designated patch of old growth is returned to an earlier seral stage, that patch may need not to be replaced; instead it can continue to age to acquire old growth characteristics. The plan direction provides for opportunities for management to enhance and expedite the development of old growth characteristics under certain circumstances.

Outside of the designated old growth patches, there will be other places on the Forests where active management does not occur over the life of this plan and where the Forests will generally age toward older seral stages. Those locations include management areas where active management is infrequent, and locations in more active management areas that will have limited human intervention, such as steep slopes, riparian areas, and inaccessible sites. These areas, in combination with the designated old growth patches, work together to ensure a network of old growth that is representative of and redundant for all ecozones, and by extension, resilient in the face of future stressors, such as wildfire, parasites, diseases, human disturbances, and climate change.

### Desired Conditions

- OGN-DC-01** A network of future old growth forests representing all ecozones and elevations are dispersed across the Forests in large, medium, and small patches. Large and medium patches provide habitats for forest interior species. Small patches function to improve the distribution or connectivity of a particular ecozone or species throughout the landscape or to support locally important conditions.
- OGN-DC-02** Old growth characteristics shift over time, and disturbances are a natural part of the system. High quality old growth characteristics, such as large, downed woody debris,

abundant snags, variable gap sizes, tip-up mounds, and undisturbed soils, etc., develop over time and are present.

- OGN-DC-03** Over decades, successional classes of the ecozones within the designated old growth network are primarily late-successional-open canopy, late successional-closed canopy, old growth-open canopy conditions and old growth-closed canopy structure, as appropriate by ecozone.

## Objectives

- OGN-O-01** Tier 2: Enhance or accelerate the development of **old growth conditions** over time, by actively managing 250 acres for each ten year interval through activities.

### *Management approaches:*

Methods for enhancing old growth condition could include increasing downed woody debris within all size classes by felling variable size trees, creating woodlands in appropriate ecozones by thinning and prescribe burning, enhancing the composition of native species, creating snags by girdling trees, and harvesting products as a side benefit of removing uncharacteristic vegetation.

## Standards

- OGN-S-01** In patches identified as part of the designated old growth network, allow vegetation manipulation, including thinning, woodland creation and prescribed burns and limited soil disturbance, for the following purposes and with project specific analysis:

- a. To enhance old growth values and characteristics, including:
  - i. Downed logs in all stages of decay;
  - ii. Old trees;
  - iii. Standing snags;
  - iv. Uneven-aged structure of canopy species;
  - v. Single and multiple tree-fall gaps;
  - vi. Abundant fungal component;
  - vii. Large trees;
  - viii. Appropriate density and basal area of canopy trees;
  - ix. Approximate composition of native forest species including trees, shrubs, and herbs.
- b. To improve forest health or prevent the spread of disease when the integrity (including characteristics) of the old growth patch or adjacent lands are threatened from conditions within the patch.

- OGN-S-02** The size and configuration of the designated Old Growth Network that is defined in the forest plan shall be maintained through the life of this plan.

- OGN-S-03** In patches identified as part of the old growth forest network, allow new road construction only after all feasible and prudent alternatives have been analyzed in the NEPA process and all impacts to old growth characteristics are minimized.

- OGN-S-04** Permit only non-motorized trails in old growth patches.
- OGN-S-05** Lands in this network are not suitable for timber production.

## Forest Health: Insects and Diseases; Non-Native Invasive Plant Species

### Background

Healthy forests are those that are stable and sustainable and able to maintain their organization and autonomy over time while remaining resilient to stress.

A non-native invasive species (NNIS) is a species whose introduction does or is likely to cause economic or environmental harm or harm to human health. Non-native invasive species have been identified as one of the four critical threats to USFS ecosystems. A result of humans interacting with forest ecosystems within a globally connected society, introduced organisms are capable of creating drastic change in the composition and structure of native forest communities. The influence of invasive species is found throughout the 11 ecozones on the Nantahala and Pisgah NFs. The Southern Region of the Forest Service maintains an updated list of species known to be invasive.

Native insects and pathogens are an important part of a healthy forest ecosystem, but when environmental and biological conditions favor their development into outbreak status, they can cause significant impacts to forests. Generally known for disturbances focused on specific species or species groups, insects and disease may affect forests on varying scales and intensity. The degree of the disturbance is generally related to the spatial arrangement of the targeted species on the landscape. Canopy gaps may be created at the individual tree or small group scale (such as those caused by oak decline) or larger sizes and scales (such as those caused by balsam woolly adelgid, chestnut blight, hemlock woolly adelgid, or southern pine beetle). Disturbance intensity may be stand replacement (balsam woolly adelgid), mixed (chestnut blight, hemlock woolly adelgid, spongy moth) or light (oak decline, elm spanworm). Insects and diseases may also affect specific portions of the landscape and associated ecozones. Southern pine beetle is likely to occur in the shortleaf pine oak and pine oak heath ecozones while hemlock woolly adelgid is likely to affect acidic coves and riparian forests.

The forestwide or district level determination to address the control, eradication, or management of forest health pests and diseases and the recovery of forest ecosystems (or species) is related to multiple factors in addition to guidance provided within the forest plan. In all cases, decisions related to forest health threats are closely coordinated with federal and state forest health partners as well as guided by national, regional, and state programs, priorities, and funding. Any attempt to prioritize treatment actions should consider visitor and employee health and safety, protection of existing investments, the known or perceived impact to the associated ecosystem (spread and mortality rates, loss of productivity, and resilience), public and cooperators sentiment, and the cost and efficacy of treatment options.

### Desired Conditions

- FHL-DC-01** Ecosystem diversity, function, and connectivity are minimally impacted by non-native invasive species and disease. Prevention, detection, and suppression techniques apply the best available science to existing and emerging forest health threats.
- FHL-DC-02** Non-native invasive plants are eradicated or controlled in order to maintain or restore healthy and resilient ecozones with primary emphases where threatened or endangered species habitat occurs.
- FHL-DC-03** Healthy native ecosystems, particularly those that support threatened and endangered species, and species of conservation concern, are maintained or restored such that non-native organisms do not adversely impact the function of ecosystem processes.

- FHL-DC-04** The public is informed about the potential spread of NNIS, including the need to reduce impacts along travel and utility corridors.

## Objectives

- FHL-O-01** Tier 1: Provide stable or **improved forest health conditions** on at least 250 acres annually where current or newly established threats are present.

Tier 2: Improve at least 500 acres annually with cooperator involvement.

*Management approaches:*

*This objective addresses targeted high priority pests. Current examples include Hemlock Woolly Adelgid, Emerald Ash Borer, and Lymantria dispar. Prioritize actions on (1) maintaining effectiveness of existing treatment areas, (2) new threats and new areas when species viability is at risk and (3) expanding treatments for species impacted by known threats.*

- FHL-O-02** Tier 1: Annually, **treat, control, or eradicate NNIS** plant species on 1,500 to 3,000 acres.

*Management approaches:*

*Select sites using the following priorities: unique habitats required for T/E or SCC; key characteristics of ecozones that provide habitat requirements for T/E or SCC. Inventory approximately 1,000 to 2,000 acres for NNIS occurrences.*

Tier 2: Annually, **treat, control, or eradicate NNIS** plant species on 3,000 to 5,000 acres: to mitigate the spread to or from adjacent lands, where high human uses occur with high risks of NNIS establishment. Inventory up to approximately 4,000 acres for NNIS occurrences.

*Management approaches:*

*Priority areas are high quality special interest areas, previously treated areas, NC Natural Heritage Program natural areas, and lands where control is completed cooperatively with adjacent state agencies or private landowners.*

## Standards

- FHL-S-01** Off-road equipment must be clean and free of plant material before entering the National Forest.
- FHL-S-02** Approve pesticide use only after site-specific evaluation. Apply pesticides according to label directions and using methods and timing to meet project objectives while reducing or eliminating effects to non-target species.
- FHL-S-03** Do not use non-native invasive plant species in revegetation or planting efforts, such as when seeding temporary openings or following road construction or reconstruction.
- FHL-S-04** Use physical barriers or buffers to protect federally listed species or SCC when using pesticides to prevent non-target effects from drift and flow of pesticide use.
- FHL-S-05** Survey for and treat NNIS before and after vegetation management and other ground disturbing activities.



## Guidelines

- FHL-G-01** Use Integrated Pest Management to adaptively prevent, control, or suppress insects, disease, and non-native pest/plant outbreaks when necessary to protect restoration and land management investments, protect adjacent lands, social, and recreation opportunities or to provide for forest visitor safety.
- FHL-G-02** Pesticides should be applied at the lowest rate effective in meeting project purposes and according to guidelines for protecting human and wildlife health.
- FHL-G-03** During management actions, retain notably healthy specimens of tree species in peril from forest health issues unless removal of the tree is needed to further mitigate the spread of infestations.
- FHL-G-04** Consider soil testing to determine the presence of potentially damaging soil pathogens prior to American chestnut experimental or future restoration plantings.
- FHL-G-05** Tools and practices such as minimizing the length of time soil is exposed, mowing before seeds are produced, or creating smaller equipment staging areas should be utilized to minimize the spread of non-native invasive plants along trails, roads, waterways, and other corridors.

## Management Approaches

Education opportunities and signage should encourage lessening the spread of exotics by incorporating key messages such as “don’t move firewood” or accepted decontamination protocols.

Recovery of American chestnut is supported through continued engagement in the Regional MOU, providing sites for field testing of blight and root pathogen resistance.

Work collaboratively with American Chestnut recovery groups on local opportunities for recovery of the species.

Support research to identify and implement effective eradication and control methods for forest health threats, including fungi that affect bats (white nose syndrome) and salamanders (chytrid).

Continue to work with Animal and Plant Health Inspection Service (APHIS) on the location, trapping and eradication of feral hogs and other nuisance species that impact sensitive habitats and hydrology.

Risks of insect and disease are reduced by conducting risk assessments, developing risk maps and responsive management options; preventing the introduction of insect and disease; and reducing impacts such that ecozones are healthy and resilient to absorb potential impacts. Early detection and rapid response occur by contributing to a monitoring and adaptive management program that includes all cooperators.

A monitoring and adaptive management program is put in place that includes cooperators for early detection and rapid response of non-native invasive plants. To the extent possible, work with adjacent landowners interested in controlling NNIS that are currently or could potentially spread onto the Forests.

## Timber Management Practices

Timber management includes a diversity of silvicultural treatments that are used to achieve desired conditions, objectives, and goals of forest resources. While historically the emphasis was on commodity production to support and strengthen the country during wartime, it has evolved through the passage of the Multiple Use-Sustained Yield Act in 1960, the National Forest Management Act of 1976, and the advancement of ecosystem management concepts embodied in the 2012 planning rule. Today timber harvest is a tool used primarily to manage for healthy forests and wildlife habitat as well as to support local communities.

Timber management includes both commercial and non-commercial tree harvest as well as reforestation treatments that are used to establish desired forests after disturbances such as harvest, fire, wind events, or insect infestations. Reforestation treatments include site preparation for natural regeneration and site preparation in advance of tree planting, which is done to ensure that desired tree species are regenerated. Release treatments are implemented after the young forest is established to guide species composition and the health and longevity of the remaining trees. Non-native and invasive species treatments and prescribed fire are also tools integrated into timber management.

Timber management and prescribed fire are often used in combination to meet forest plan objectives and desired conditions. For example, in fire adapted forest communities prescribed fire and timber management are used in the same silvicultural prescription to achieve open structural conditions or woodlands that are typical on xeric sites and sites of moderate moisture potential.

Silvicultural prescriptions are based on existing conditions determined through data collection and interpretation and are designed to meet desired conditions identified in the forest plan while adhering to design criteria identified at the forestwide, management area, or individual project levels.

### Desired Conditions

- |                  |  |
|------------------|--|
| <b>TIM-DC-01</b> | Stand conditions, such as composition, structure and health will improve using a variety of methods, such as stand improvements, slashing and felling, timber harvest, burning, etc.   |
| <b>TIM-DC-02</b> | Timber harvest <sup>11</sup> occurs on lands identified as suited for timber production, <sup>12</sup> as well as lands identified as not suited for timber production. Together, these harvesting activities will provide a flow of wood products that benefit local communities. |
| <b>TIM-DC-03</b> | Forest product commodity outputs contribute to the social and economic well-being of the people living in the area and help maintain a way of life long associated with western North Carolina.  |
| <b>TIM-DC-04</b> | Industries can rely on Forest Service timber for high quality commercially valuable products.  |
| <b>TIM-DC-05</b> | Products resulting from timber management that don't currently contribute to commercial markets can contribute to or expand niche-markets utilizing a broader suite of forest materials.   |

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<sup>11</sup> Timber harvest is defined as the removal of trees for wood fiber use and other multiple use purposes (36 CFR 219.19).

<sup>12</sup> Timber production is defined as the purposeful growing, tending, harvesting, and regeneration of regulated crops of trees to be cut into logs, bolts, or other round sections for industrial or consumer use (36 CFR 219.19).

- TIM-DC-06** Lands identified as suitable for timber production have a regularly scheduled timber harvest program that contributes to forestwide desired conditions. Rotation ages needed to meet restoration and habitat objectives for young forest and future middle-aged mast producing forests are also compatible with the production of sawtimber and pulpwood products.
- TIM-DC-07** Land identified as not suitable for timber production, but where timber harvesting could occur for other multiple-use purposes, has an irregular, unscheduled timber harvest program. Harvest meets management direction and desired conditions for the area while providing services and benefits to the public.

## Objectives

See Integrated Ecosystem and Wildlife Habitat Objectives for objectives related to timber.

## Standards

- TIM-S-01** Timber production will not be the primary purpose for projects and activities and shall complement ecological restoration. Confirm lands suitable and not suitable for timber production within project areas during site-specific analysis.
- TIM-S-02** While timber harvest can occur on lands both suitable and not suitable for timber production, unless otherwise specified in management area direction, it can only occur on lands not suitable for timber production when it is determined that timber harvesting activities are needed for salvage or to protect multiple use values other than timber production, such as, but not limited to:
- (1) addressing issues of public health or safety;
  - (2) reducing hazardous fuels and managing wildfire;
  - (3) restoring or maintaining a terrestrial or aquatic ecological system or wildlife habitat over time;
  - (4) restoring or maintaining habitat for federally threatened and endangered animals or plants and SCC;
  - (5) harvesting dead or dying trees due to fire, natural disturbances, insects, and disease;
  - (6) restoring or maintaining recreation, scenery, or transportation management;
  - (7) accommodating special use permits and outstanding rights; or
  - (8) for research, demonstration, or education purposes.
- TIM-S-03** Timber harvest shall be carried out consistent with the appropriate mitigation of effects to soil, watershed, fish, wildlife, recreation, and scenic and heritage resources.
- TIM-S-04** Timber harvest shall occur only where:
- A site-specific finding determines that soil, slope, or watershed conditions would not be irreversibly damaged.
  - There is assurance that such lands can be adequately restocked within five years after harvest.
  - Protection is provided for streams, streambanks, shorelines, lakes, wetlands, and other bodies of water.

- TIM-S-05** Timber will be harvested only where the harvesting system is not selected primarily because it will give the greatest dollar return or unit output of timber.
- TIM-S-06** Conduct a site-specific review to determine the appropriate logging systems for management on sustained slopes (> 200ft) over 40 % slope.
- TIM-S-07** Design, construct and maintain erosion control features to meet soil and water quality standards. In particular:
- a. Follow North Carolina performance standards as outlined in Forest Practices Guidelines Related to Water Quality (NC FPGs) by implementing effective soil and water Best Management Practices, such as those outlined by the USFS' National Core BMP Technical Guide.
  - b. Plan forest management activities to minimize detrimental soil disturbance, stream crossings and avoid springs, seeps, and hydric soils.
  - c. Designate stream crossings on the ground, giving preference to locations where:
    - i. Approaches to streams are relatively flat to better control erosion.
    - ii. The crossing can be installed at a right angle to the stream channel so crossing distance is minimized.
  - d. To cross established stream channels during logging:
    - i. Use temporary bridges when feasible. Alternatively, select the type of crossing (bridge mat, culvert, ford, or pole crossing) based on site characteristics and the ability to best protect water quality while providing safe and efficient access. When these crossings are removed, natural hydrology and soil stabilization must be restored.
    - ii. Maintain channel depth, width, gradient, and capacity at the crossing.
    - iii. Perform construction, installation, and removal work during low-water if circumstances allow.
    - iv. Stabilize crossing approaches so sediment is not transported into the stream.
  - e. In valley bottoms where soil disturbance may create new channels avoid skidding logs up and down low areas.
  - f. During skidding operations, minimize skid roads and utilize skid trails instead, when feasible and skid logs over logging slash placed in the travel way when feasible to reduce detrimental soil impacts.
  - g. Avoid skidding when wet soil conditions are likely to result in excessive rutting or compaction.
  - h. In cable logging units, use cable that suspends at least one end of the log unless site-specific analysis determines that other logging methods meet soil and water protection standards.
  - i. When yarding through streamside zones, the entire log shall be suspended. When needed, create skyline corridors not to exceed 20 feet in width through streamside zones by cutting the overstory to prevent uprooting of trees. These logs can be harvested unless they would benefit the streamside zone (e.g.,

provide salamander cover, ruffed grouse drumming logs, or large wood sources for streams).

- j. Avoid “stacking<sup>13</sup>” multiple skid roads on steep slopes. Consider obliterating legacy skid roads on steep slopes where soil or water quality is a concern.
- k. The project or activity authorizing the temporary road or trail shall decommission the temporary access when no longer needed using techniques such as, but not limited to, removing drainage structures, re-contouring, and stabilizing the final slope. (See also TA-S-08)

**TIM-S-08** Restocking levels for suitable timber lands are defined in Table 7. Restocking on planted or natural regeneration sites may occur outside the desired ranges below with a project-specific determination. These restocking requirements apply to the areas prescribed for regeneration in both even-aged and uneven-aged silvicultural systems and their resulting harvests.

**Table 7. Restocking Levels for Regeneration Harvests on Timber Suitable Lands, by Species Group**

Forest Community Types	Minimum (tpa)	Target Range (tpa)
Hardwoods (All Species)	100	250 – 350
Mixed Pine-Hardwood	250	400 – 600
Pines	300	500 – 700
Spruce & Fir	300	500 – 700

**TIM-S-09** Adequate restocking levels for lands unsuitable for timber production must be specified in the silvicultural prescription that occurs after a site specific NEPA decision, based on the plan’s desired conditions and objectives applicable to the area and consistent with all other applicable plan components.

**TIM-S-10** When salvage or sanitation occurs in disturbances of complete overstory removal (e.g., wind, fire, insect, or disease), apply regeneration-based stocking standards.

### Applicable to Uneven-Aged Management Systems

**TIM-S-11** Uneven-aged management-based opening sizes are guided by the equivalent of two-tree heights of surrounding mature trees. Variation in opening size may occur.

**TIM-S-12** For uneven-aged silvicultural systems, openings may be clustered closer than 330 feet as long as their combined acreage (open) does not exceed the maximum even-aged opening size for the forest type or ecozone community (see TIM-S-14).

### Applicable to Even-Aged Management Systems and Two-Aged Silvicultural Systems

**TIM-S-13** Even-aged regeneration cutting will be used only where the interdisciplinary review process has been completed.

**TIM-S-14** Limit the size of openings created in one harvest operation under even-aged (including two-aged) regeneration objectives to 40 acres in all hardwood communities. Within the

<sup>13</sup> “Stacking” is the excavation of multiple parallel skid roads across sustained steep slopes for the purpose of logging the mountain side using ground-based harvesting equipment.

shortleaf pine, shortleaf pine-oak, and pine oak heath ecozone or on appropriate shortleaf pine and pine oak heath sites<sup>14</sup> even-aged opening sizes are limited to a maximum of 80 acres in size (36 CFR 219.11(d)). The following exceptions apply:

- i. Where pine forest types exist in an offsite condition, they may be removed through even-aged regeneration methods (up to 80 acres per harvest unit); where ecologic objectives require restoration to another more appropriate forest community such as dry oak, dry mesic oak, mesic oak, shortleaf, shortleaf pine-oak, pine oak heath, cove, or high elevation red oak communities (36CFR 219.11(d)(4)) (Sec 64.21 2012 Planning Rule).
- ii. Proposals for larger even-aged openings (than above), on an individual timber sale basis, are subject to a 60-day public notification and review by the regional forester;
- iii. The maximum size for openings to be cut in one harvest operation shall not apply to the size of openings harvested as a result of natural catastrophic conditions such as fire, insect and disease attack, or windstorm (16 U.S.C. 1604(g)(3)(F)(iv)). (36 CFR 219.11(d)(4)).

**TIM-S-15** An even-aged or two-aged regeneration area where timber production is an objective, or a future full-site utilization is desired, will no longer be considered a temporary opening when:

- i. It has reached a minimum age of five years and has been certified stocked; and
- ii. The young forest canopy has closed initiating the stem exclusion phase (stand dynamics). This age is variable based off species composition, ecozone, and site productivity of the stand.

**TIM-S-16** Areas managed or to be managed as permanent openings are not included in calculations of opening size, even when within or adjacent to created even-aged temporary openings.

**TIM-S-17** Clearcutting will be used only where determined to be the optimal method or where site- specific finding is determined to be the optimal method. Clearcutting may be appropriate:

- i. To restore species compositions more appropriately suited to site, climatic, topographic, or geographic conditions.
- ii. To establish, enhance, restore, or maintain habitat for threatened and endangered species, and species of conservation concern..
- iii. To enhance wildlife habitat or to provide for recreation sites, scenic vistas, utility lines, road corridors facility sites, reservoirs, or similar development.

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<sup>14</sup> The shortleaf pine community is one of the southern pine forest types referenced in 36 CFR 219.11(d)

- iv. To rehabilitate or restore lands adversely impacted by events such as fires, wind- storms, or insect or disease infestations.
  - v. To preclude, minimize or mitigate the occurrence of potentially adverse impacts from insect or disease infestations, windthrow, or other factors affecting forest health.
  - vi. To provide for the establishment and growth of desired shade intolerant trees or other shade intolerant vegetation.
  - vii. To rehabilitate poorly stocked stands resulting from past management practices or natural events.
- TIM-S-18** To meet restoration, management, research, demonstration, or educational needs, use other even-aged regeneration methods only where determined to be appropriate and where a project specific finding determines the even-aged cut is appropriate.
- TIM-S-19** Even-aged regeneration cut blocks will be shaped and blended with the natural terrain to meet scenery, wildlife habitat, restoration, and resiliency objectives.
- TIM-S-20** Separate even-aged or two-aged harvest regeneration openings from each other by a minimum distance of 330 feet. In the foreground of high scenic interest (Class A) areas a distance of 660 feet may be desired based on site specific review.
- TIM-S-21** Spacing requirements do not apply to salvage treatments.
- TIM-S-22** Even-aged or two-aged regeneration cutting may be located adjacent to uneven-aged stands at any time.
- TIM-S-23** Even-age stands with timber production as a secondary objective shall generally have reached culmination of mean annual increment (CMAI) before regeneration harvests, except for the following:
- i. Silvicultural activities that are not designed to regenerate even-aged stands. Examples include thinning, stand improvement, uneven-aged systems, etc.
  - ii. Damaged stands (e.g., fire, wind, or other catastrophe) or those in imminent danger from insect or disease attack (e.g., oak decline, emerald ash borer, spongy moth, etc.).
  - iii. Timber harvest on lands not suited for timber production.
  - iv. When shorter rotations are needed to meet age class distribution or project restoration goals or objectives.
- Refer to Appendix B for estimates of ages for CMAI.
- TIM-S-24** Strategically distribute age classes for wildlife habitat requirements, restoration, resiliency, timber production, diversity, or enhancement of other resources.

## Guidelines

- TIM-G-01** For vegetation management treatments, road and skid trail locations least likely to cause damage to soil and water resources should be selected. Use existing roads when feasible.

- TIM-G-02** Timber production should not occur on hydric<sup>15</sup> soils. Project-specific determinations of hydric soil locations may occur so they can be considered in project design.
- TIM-G-03** Existing regional progeny tests and improved seed production areas should be maintained.
- TIM-G-04** When regenerating forest stands, regeneration should be native tree species that commonly occur naturally on similar sites within that community or ecozone and that are expected to be resilient to climatic changes.
- Natural regeneration should be emphasized in all communities but especially hardwood forest types and ecozones.
  - Artificial regeneration should be used where needed to increase future mast production, increase species diversity or abundance, or restore lost species. Artificial regeneration should use genetically local and native improved seeds and seedlings, and selection of planting stock should be appropriate for reasonably anticipated changes to climate.
- TIM-G-05** Where management objectives include regeneration of advance growth dependent species (AGDS), (such as oaks, hickories, sugar maple, black walnut, buckeye, black cherry), the desired future stocking of these species should be supported through use of pre-harvest site preparation, planting, and shelter wood treatments that establish and promote individuals of a competitive stature. Managers should track the development of AGDS using surveys and determine their competitiveness prior to regeneration treatments.
- TIM-G-06** Stand improvement practices should be used to manage stages of intermediate stand development and support desired species on the site or within the ecozone across all site types and communities where desired species composition and growth needs to be promoted. Use national database tools and surveys to track the development of young and mid-aged stands after the regeneration phase to ensure desired species composition is maintained.
- TIM-G-07** While restoring woodlands with mechanical equipment, project design should consider maintaining large high-quality patches of native grasses and herbs, such as little bluestem and Indian grass.

### Management Approaches

In regeneration harvests (planted or natural), restocking to meet NFMA will vary based on the desired conditions for the community, including restoration and resiliency goals, the future structure desired, and whether or not the unit of land is suitable for timber production. Determination of desired future conditions occur at the project level, are managed using a detailed silvicultural prescription, and are evaluated after NFMA restocking certification, when stands are in the reorganization stage. Monitoring of species composition and additional treatments should occur after NFMA certification through crown closure to ensure desired species remain competitive.

Recommended residual stocking for intermediate harvests where the stand has trees of merchantable size (five-year restocking requirement does not apply).

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<sup>15</sup> Hydric soil is soil which is permanently or seasonally saturated by water resulting in anaerobic conditions.



**Table 8. Recommended residual stocking for intermediate harvests**

Non-Regeneration Harvest	Desired Stocking	Adequate Stocking
Thinning (timber suited lands)	60 to 70% stocking <sup>16</sup>	60 to 80% stocking <sup>17</sup>
Woodland (xeric site -all lands)	40 to 60% canopy cover	<70% canopy cover
Woodland (moderate site – all lands)	50 to 70% canopy cover	<80% canopy cover
Permanent Opening <sup>18</sup>	Only trees desired by opening goals and objectives	Only trees desired by opening goals and objectives
Salvage or Sanitation <sup>19</sup>	All remaining healthy and undamaged or unsusceptible trees unless their harvest is required by prescription	All remaining healthy and undamaged or unsusceptible trees unless their harvest is required by prescription

See also the Integrated Ecosystem and Wildlife Habitat Management Approaches.

<sup>16</sup> An appropriate measure of stocking (relative density, stand density index, etc.) above an understocked condition.

<sup>17</sup> Ibid.

<sup>18</sup> Based on desired condition. Requires land suitability change in FSVeg.

<sup>19</sup> When salvage or sanitation occurs in disturbances of complete overstory removal (e.g., wind, fire, insect, or disease), apply regeneration-based stocking standards.

## Fire and Fuels

### Background

Fire plays an important role in shaping the vegetation and landscape in western North Carolina. Recurring fire has been a part of the landscape for thousands of years. Aggressive fire suppression, coupled with an array of other disturbances (e.g., logging and chestnut blight), has changed the historic composition and structure of the forests. Periodic prescribed burning and other vegetation management can recreate the ecological role of fire in a controlled manner. While fires may have been frequent on the landscape, the intensity and effects of fire vary within and between vegetation types. The ecozone section of the forest plan provides more discussion of fire-adapted plant communities. The drier ridgetops and south to west facing slopes, typically dominated by pine and some dry-site oaks, had the most frequent and intense fires, while the cove and riparian areas had less frequent and very low intensity fires. Typically fires on the upper drier slopes would be naturally extinguished as they burned into the cool moist habitats in coves and along streams.

Fire and fuels management supports a variety of desired conditions and objectives across the Forests (e.g., community protection, hazardous fuels reduction, native ecosystems restoration, historic fire regimes restoration, wildlife openings, and open woodland creation, etc.). Managers can influence the effects of fire by proactive measures, such as thinning, prescribed fire, fuel break construction, or by responding to wildfires or unplanned ignitions when they occur. Wildfire suppression efforts will be commensurate with the values at risk, meaning fire occurrences that threaten life, property, and infrastructure will see more aggressive suppression strategies. Where threats to resources are low, a wider range of actions will be considered. Decisions about how to manage fires depend on a number of factors such as fire location, fuel conditions, seasonality, weather, smoke, available firefighting resources and land management objectives, natural and manmade barriers, probability of success, and climate change-driven shifts in seasonal burn windows. On a given fire, you may see one area of full suppression protecting homes and infrastructure and another area may manage the fire for the benefit of fire adapted ecosystems.

With the Forests situated in Wildland Urban Interface, wildfire can cross and affect all lands and resources regardless of jurisdiction and ownership. The Forests border a mix of ownerships with residences and personal property, infrastructure, and other high value resources. Above all else, the top priority for the management of fire is firefighter and public safety.

### Desired Conditions

- FR-DC-01** Fires, both wildfire and prescribed fire, occur on the landscape creating a mosaic of burned and unburned areas.
- FR-DC-02** Wildfire that results from natural ignitions (lightning) functions in its natural ecological role as nearly as possible, while life and property (public and private) are protected. Critical resource values including soil, air, and water quality are maintained.
- FR-DC-03** The risk of losing key ecosystem components from the occurrence of high severity wildfire remains relatively low.
- FR-DC-04** Wildland urban interface areas are managed to protect human life, enhance protection of nearby homes and improvements, and provide an area where firefighters can safely conduct tactical operations.
- FR-DC-05** Prescribed fire is well planned, scheduled and executed to manage vegetation, restore and maintain fire adapted ecosystems and species, create desired wildlife habitat

conditions, promote herbaceous ground cover to help control erosion, and modify fuel loads to reduce wildfire intensity. Desired fire return intervals associated with fire-adapted ecozones are defined in Table 9.

**Table 9. Desired Fire Return Interval for Restoring or Maintaining Fire-Adapted Ecozones<sup>20</sup>**

Ecozones	Average Desired Fire Return Interval-Restoration (yrs)	Average Desired Fire Return Interval-Maintenance (yrs)
Pine Oak Heath, Shortleaf Pine Oak Heath	1-3	3-5
Dry Oak	3-5	5-10
Dry Mesic Oak	5-7	15-20
Mesic Oak, High Elevation Red Oak	5-10	18-25

- FR-DC-06** Smoke impacts on adjacent landowners and the public from prescribed fire activities on the Forests are minimal and short-term. Furthermore, the North Carolina Division of Air Quality does not identify any prescribed fire emissions as a significant contributor to any National Ambient Air Quality Standards (NAAQS) exceedance.
- FR-DC-07** Fine particles released from the Forests' prescribed fires are not identified as a significant contributor to visibility impairment at any federally mandated Class I area in Western North Carolina.

## Objectives

See the Integrated Ecosystem and Wildlife Habitat Objectives for objectives related to prescribed fire.

## Standards

- FR-S-01** Follow the North Carolina Smoke Management Guidelines and national fire-retardant aerial application guidance.
- FR-S-02** Utilize atmospheric dispersion modeling to predict air pollution concentrations when populated or sensitive areas could be impacted. Prescribed fire can be conducted if the atmospheric dispersion model predicts air pollution concentrations are low enough to protect the public's health and safety.
- FR-S-03** Follow the National Core BMP Technical Guide, wildland fire management guidance to protect water quality.
- FR-S-04** If existing or planned NFS trails are used for access or to create fire lines associated with prescribed burns or wildfire suppression, trails impacted by fire operations shall be repaired to meet agency standards for appropriate trail classes and use-types, including restoration of unique recreational values and use of sustainable trail design principles.

<sup>20</sup> The following ecozones are not considered fire-adapted, and fire return intervals exceed multiple planning cycles: Northern Hardwood; Rich Cove; Acidic Cove; Floodplain Forest; Spruce Fir.

## Guidelines

- FR-G-01** Firelines which expose mineral soil should not be located in streamside zones unless tying into waterbodies as firebreaks at designated points with minimal soil disturbance. Where construction of dozer fireline within streamside and filter zones and across stream channels is required, consult with local resource advisors.
- FR-G-02** Use existing barriers (e.g., streams, wetlands, roads, and trails) where possible to reduce the need for new fireline construction and to minimize resource impacts.
- FR-G-03** Allow low intensity wildfire and prescribed fire in streamside zones to enhance diversity of the area through a mosaic of burned and unburned conditions. In these zones, manage fire for low burn severity when possible, unless ecosystem restoration guides otherwise.

## Management Approaches

Coordinate with neighbors in an all lands approach to meet land management objectives which may differ by jurisdiction.

Follow the Forest's latest practices on repair of fire lines following fire suppression.

Focus on increased implementation of prescribed fire as a habitat and fuels management tool across all seral stages while avoiding or safeguarding areas where fire will have harmful impacts to forest resources.

Coordinate with state and cooperative programs, such as the Fire Learning Network, to increase capacity for prescribed burning.

Increase the use of prescribed fire through all lands approach and collaborative tools (such as Good Neighbor Authority) to increase forest resilience. Utilize multiple burns/entries to create desired forest structure and species composition.

Consider the utilization of prescribed fire in post-harvest and young forest wildlife openings to maintain, enhance, and direct plant composition toward desired conditions.

Maintain and restore southern pine forests through prescribed fires that are moderate to high intensity and result in larger openings and high mortality.

Participate in the development of Wyden and Stevens agreements to enhance cross boundary treatments and an all lands approach to prescribed fire.

Participate in CPP and support activities on Forest lands as well as state jurisdiction through Community Protection Plans, Fire Adapted Community, and fuel mitigation efforts throughout the 18-county region of Western North Carolina.

In addition to the National Core BMP Technical Guide, refer to North Carolina Forestry Best Management Practices Manual to Protect Water Quality, Ch. 9 Fire Management (NC Division of Forest Resources 2006 or newer)

**See also:** Air; Terrestrial Ecosystems

## Lands and Special Uses

### Background

The lands program consists of the special uses program that serves a local, regional, or national public benefit and need that cannot be accommodated on non-Federal land; the acquisition, disposal, and exchange of lands to meet resource management needs; as well as maintaining approximately 4,000 miles of landline boundary between National Forest System lands and private lands.

Special uses across the planning area sustain benefits to the American people, meet energy resource needs, sustain and enhance recreation opportunities, and improve the quality and availability of outdoor recreation experiences. This includes utility corridors and transmission lines, communication sites, water transmission, military training activities, outfitting and guiding services, and special events.

Authorizations for access to private land across NFS land are considered special uses, as are recreational activities such as outfitting and guiding and competitive events such as foot races, horse endurance races, and mountain bike races. These recreational activities provide opportunities for the public to take part in hiking, biking, climbing, rafting, horseback riding, and fishing within the Forests. Public desire for recreation permits has seen a steady increase with permits for mountain biking events and activities representing a major source of demand.

### Lands

#### Desired Conditions

- LSU-DC-01** National Forest System lands are consolidated, providing reasonable access and efficiency of land management while protecting resource values. NFS lands exist in a pattern that supports efficient management, which consists of large contiguous areas and wildlife connectivity.

#### Standards

- LSU-S-01** Acquired rights-of-way shall provide access to National Forest System lands for public and administrative needs.
- LSU-S-02** When compatible, manage new land acquisitions according to adjacent or surrounding management area prescription. When not compatible with the resource values of the acquisition, or if the acquired land is not adjacent to or surrounded by existing NFS lands, review the management area chapter to determine the appropriate management direction for the acquired lands.

#### Guidelines

- LSU-G-01** Land ownership adjustments should contribute to maintaining larger intact ecosystems or improve recreational or management access.
- LSU-G-02** Land adjustments should not result in net loss of reservoir shoreline in order to ensure a naturally replenishing source of complex shoreline and littoral zone habitat in reservoirs and a unique recreational experience for the public.
- LSU-G-03** Prioritize land acquisitions by the following (in no particular order):
- i. Lands and associated riparian ecosystems on water frontage such as lakes and major streams.

- ii. Critical habitat lands needed for the protection of federally listed endangered or threatened fish, wildlife, or plant species. Supports objective of protection of fish and habitats.
- iii. Lands needed for the protection of significant historical or cultural resources when these resources are threatened or when management may be enhanced by public ownership.
- iv. Lands that enhance recreation opportunities, public access, and protection of aesthetic values.
- v. Lands needed for protection and management of administrative and congressionally designated areas including Wilderness, Wild and Scenic River corridors, National Scenic Trails, and National Historic Trails.
- vi. Lands needed to enhance or protect watershed improvements that affect the management of National Forest System riparian areas.
- vii. Environmentally sensitive lands such as wetlands and old growth.
- viii. Timber resource management.
- ix. Lands that promote more effective management of the ecosystem and reduce administrative expenses through consolidation of National Forest system ownership or split estates.

**LSU-G-04** Land conveyances will be guided by the following criteria (in no particular order):

- i. Parcels that will serve a greater public need in state, county, city, or other Federal agency ownership.
- ii. Inaccessible parcels isolated from other National Forest System lands. Parcels intermingled with private lands.
- iii. Parcels within major blocks of private land or intensively developed private land, the use of which is substantially for non-National Forest System purpose.
- iv. Parcels having boundaries, or portions of boundaries, with inefficient configurations (projecting necks or long, narrow strips of land, etc.). Supports more logical and efficient management.

## Management Approaches

Work closely with adjacent landowners, North Carolina, and other Federal agencies to resolve rights-of-way issues.

Work with adjacent landowners to minimize conflicts between the Forest Service and private landowners and resolve access issues.

## Special Uses

### Desired Conditions

- LSU-DC-02** Special uses serve a local, regional, or national public benefit and need that cannot be accommodated on non-Federal land.

- LSU-DC-03** Special uses are authorized and managed to support and contribute to the protection of natural resource values and the promotion of public health and safety.
- LSU-DC-04** Special use activities leave little evidence of impacts and are compatible with other visitor uses, site capacity and recreation management.
- LSU-DC-05** Permanent structures associated with special uses are centrally located or concentrated on existing sites or designated corridors to minimize the number of acres encumbered and are compatible with other resource objectives.

## Standards

- LSU-S-03** Authorize and manage special uses to be consistent and compatible with the desired conditions of the applicable management area, unless there is a compelling need or benefit for public health and safety. If such a compelling need or benefit related to public health and safety is essential, mitigate the proposed activities within the management area prescription to the fullest extent possible.
- LSU-S-04** Utility corridors and communication sites on National Forest System lands shall be located, designed, and managed to minimize adverse environmental, social and scenery impacts.
- LSU-S-05** Permitted special uses are compatible with visitor use, site capacity and recreation management.
- LSU-S-06** Prior to authorizing or re-authorizing new or existing diversions of water from any aquatic resource, in-stream flow or lake level needed to protect stream processes and aquatic and riparian habitats shall be identified. Water shall not be diverted from these resources when an instream flow or water level assessment indicates the diversion would adversely affect protection of stream processes, aquatic and riparian habitats and communities, or recreation and aesthetic values.
- LSU-S-07** The Forest shall not designate new recreation residence tracts.
- LSU-S-08** Existing recreation residences shall continue to be authorized.
- LSU-S-09** Special uses that can reasonably be met on private lands shall not be approved unless they are clearly in the public interest.
- LSU-S-10** Place distribution lines for utilities underground except when:
  - i. Burial within National Forest System lands is incompatible with adjacent overhead lines on private or other public lands, or
  - ii. Burial is not technically feasible, (or) not feasible due to geological or resource conditions, (or) cost prohibitive, (or) greater long-term disturbance would result; and management area objectives can be met using an overhead line.
- LSU-S-11** Aerial application of herbicides shall not be authorized in special use authorizations as a tool for vegetation maintenance.
- LSU-S-12** Special use applications for new *private* water uses such as domestic, agricultural or fish production shall not be authorized. Additionally, these existing *private* uses will be phased out over time.

- LSU-S-13** Authorize research activities only for approved scientific purposes and academic interests where data will be provided to the Forest Service. Validate other applicable permits (e.g., NCWRC, USFWS) prior to issuing.
- LSU-S-14** Equipment cleaning practices shall be incorporated in special-use authorizations, where needed, to prevent the introduction and spread of non-native invasive plants.

### **Guidelines**

- LSU-G-05** Respond to special use requests according to the following priorities:
- i. Those related to public safety, health, and welfare (e.g., highways, utility transmission, renewable energy development, and public service improvements).
  - ii. Those contributing to the general public benefit (e.g., public access, transportation efficiency for commerce, a reliable supply of electricity, natural gas, water, and a communication network).
  - iii. Those that benefit only private users (e.g., road permits, rights-of-way for power lines, telephones, waterlines, etc.).
- LSU-G-06** In-stream flow or lake level needs sufficient to protect stream processes, aquatic and riparian habitats, communities and recreation, and scenic values should be determined prior to authorizing or reauthorizing special uses that pertain to the collection of water resources on the Forests.
- LSU-G-07** Towers for 69 kV lines and above should be self-weathering with non-reflective lines, and where topography allows, should be located in areas that blend in with the terrain or background.
- LSU-G-08** Low growing vegetation that does not interfere with overhead lines should be maintained within power line corridors to provide for wildlife habitat and other resource benefits, in accordance with appropriate best management practices.
- LSU-G-09** To reduce the need for new communication sites and new transmission line corridors, co-locate this infrastructure or expand existing sites to minimize the number of acres encumbered.
- LSU-G-10** Communication site management plans, including site boundaries, should be implemented at each communication site.

### **Management Approaches**

Coordinate with Tennessee Valley Authority on managing access and special uses around impoundments.

When incorporating beneficial wildlife habitat management into the maintenance of linear rights-of-ways and communication sites, consider emphasizing pollinator friendly species and Appalachian Mountain Joint Venture's (AMJV) Best Management Practices (BMPs) for the Golden-winged Warbler.



## **Boundary Management**

### **Desired Conditions**

- LSU-DC-06**    Boundary lines and property corners are easily locatable and highly visible.
- LSU-DC-07**    Boundary lines shall be surveyed, marked, and recorded in support of land management objectives, litigation, and encroachment resolution.

### **Guideline**

- LSU-G-11**    Boundary lines should be surveyed and marked to National Forest System standard.

## Transportation and Access

### Background

Most users of the Nantahala and Pisgah National Forests use motor vehicles to access the Forests, whether for recreational sightseeing, camping and hiking, hunting and fishing, commercial purposes such as logging, administration of utilities and other land uses, outfitting and guiding, or the many other uses of National Forest Service (NFS) lands. The Forests are among the most visited in the National Forest system, creating a high need for access and maintenance.

The NFS road system components that provide this access are highly diverse, ranging from double lane paved roads to single lane gravel or native material surface high clearance roads that may not be usable by passenger cars. Forest roads are currently classified using Road Management Objectives and Maintenance Levels (ML). These reflect the levels of access that are provided and the type and frequency of maintenance that are needed to reduce risks to public safety and negative impacts to resources. The classified road system also includes routes that are closed for multiple-year periods.

### Desired Conditions

- TA-DC-01** A sustainable, well-maintained transportation system provides safe and efficient public access and connectivity among communities and the Forests. The transportation system reflects the expected levels of use and public desires while having minimal impacts on resources.
- TA-DC-02** Roads and trails serve a variety of public and administrative needs including access for recreational purposes, vegetation and wildlife management, fire suppression activities, facilities, private land inholdings, and energy and mineral development.
- TA-DC-03** Access is provided for tribal members for cultural and ceremonial practices.
- TA-DC-04** The transportation system is connected to federal, state, and local roads and trails.
- TA-DC-05** The transportation system's size and type are able to be maintained to Forest Service standards using resources available to the Forests.
- TA-DC-06** Where possible, the transfer of maintenance jurisdiction of Forest Service system roads to another jurisdiction is utilized to accomplish road maintenance.
- TA-DC-07** Unneeded roads are removed from the system and decommissioned, following public involvement and site-specific environmental analysis, to eliminate environmental effects of the roads and achieve ecological, terrestrial, and hydrologic restoration objectives.
- TA-DC-08** Roads do not contribute to migration stress of small ranging wildlife species, such as terrestrial salamanders, and barriers are mitigated where needed.
- TA-DC-09** Road cut and fill slopes are stable and engineered to reduce the risk of landslides.
- TA-DC-10** All roads are in full compliance with Federal and state surface water quality standards and regulations.
- TA-DC-11** Intended road use is communicated effectively to users through maps and signage. All designated routes open to wheeled motorized vehicles are shown on a Motor Vehicle Use Map (MVUM) that is available to the public and shows the types of vehicles allowed on each designated road and any seasonal restrictions that apply on these routes. Motorized vehicle use only occurs as identified on the MVUM, except as authorized or

for administrative uses. Changes in road use designation are reflected on the updated MVUM.

**TA-DC-12** Access is designed to minimize conflicts among user groups.

**TA-DC-13** The transportation system does not exacerbate the spread and transmission of nonnative invasive species, forest pests or diseases.

## Objectives

**TA-O-01** Tier 1: Maintain 280 miles of roads to standard annually across the Nantahala and Pisgah by performing maintenance, reducing road maintenance level, or decommissioning unneeded roads.

Tier 2: Reduce the maintenance backlog by an additional 10% annually.

**TA-O-02** Tier 1: Re-evaluate and update the **Travel Analysis Report (TAR)** report within three years of plan approval. This process will identify opportunities to adjust the Forests road system so that it considers access for public and Forests management activities, minimizes road- and trail-associated environmental impacts and public safety risks, considers site-specific priorities and opportunities for road improvements and decommissioning and can be maintained within budget constraints. Future development and implementation of Travel Analysis Report recommendations and best available FS data will identify a minimum road system.<sup>21</sup>

**TA-O-03** Tier 1: Develop and implement a **forestwide road maintenance plan** that identifies priority maintenance activities, funding sources, and performance responsibilities over the life of the plan. The work presented in this plan is prioritized to promote public safety, prevent erosion and sedimentation, protect water quality, and maintain access to the Forests with an emphasis on priority watersheds.

**TA-O-04** Tier 1: **Unauthorized road and trail miles** within priority watersheds and Inventoried Roadless Areas will be identified and prioritized for obliteration to minimize erosion and sedimentation. A minimum of 20 miles of unauthorized roads and 30 miles of unauthorized trails will be restored to natural contours during the life of the plan.

**TA-O-05** Tier 1: Annually daylight at least two miles of roads, with an emphasis on closed roads within North Carolina Wildlife Resources Commission Wildlife Habitat Active Management Area priority areas, to create young forest conditions and for road improvement.

Tier 2: Annually daylight at least five miles, with an emphasis on closed roads within North Carolina Wildlife Resources Commission Wildlife Habitat Active Management Area priority areas, to create young forest conditions and for road improvement.

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<sup>21</sup> The TAR is not a decision process nor does it constitute a major federal action. The output of this analysis will be a report that identifies, among other things, the minimum road system needed, which is the system needed to meet adopted resource management objectives (36 CFR part 219), applicable statutory and regulatory requirements, long-term funding expectations, and to minimize adverse environmental impacts from road activities (36 CFR 212.5(b)(1)). The TAR process will identify and analyze issues, risks, benefits, and opportunities for possible future changes to the road system. Recommendations made in TARs may be carried forward in NEPA projects. Future projects shall be informed by the TAR and, where practicable, may result in altering road management objectives, decommissioning unneeded roads, adding system roads to support management objectives, or transferring maintenance responsibilities to other entities.

- TA-O-06** Tier 1- No net decrease in the miles of open roads in Interface and Matrix over the life of the plan.
- Tier 2 - Increase mileage of seasonally open roads in Interface and Matrix by 5-10% over the life of the plan, prioritizing recreational access, such as hunting and fishing.
- Determine the amount of unneeded roads in Backcountry and decommission 10% over the life of the plan.

## Standards

- TA-S-01** Motorized use on open public roads is limited to licensed vehicles and operators that comply with North Carolina motor vehicle laws.
- TA-S-02** Cross-country motorized use off of open and designated roads and trails is prohibited except in the case of emergency, such as wildland fire or search and rescue.
- TA-S-03** Construction of new travel routes shall only be planned, constructed, and designated following public involvement and site-specific environmental analysis.
- TA-S-04** Roads shall be located and designed to minimize impacts to resources:
- i. Road design shall comply with traffic service level and road management objective standards;
  - ii. Erosion of and sediment movement away from all components of roadways during and after construction shall be controlled and mitigated using measures identified through storm drainage design and through the implementation of the National Core BMP Technical Guide . Consider climate change predictions of changing precipitation when designing drainage control features (rolling-dips, culverts, grade-sags, etc.) that are of adequate frequency and size to ensure runoff is able to seep into the soil without causing erosion, including gullies and catastrophic events of mass movement of road material;
  - iii. Stream crossings will be avoided where alternative routes are possible and feasible;
  - iv. Stream crossings shall be designed to allow passage for native aquatic organisms, including amphibians, where needed by the species<sup>22</sup> and shall be designed to minimize impacts, including erosion and sedimentation from the road;
  - v. Stream crossings shall occur at right angles with the natural alignment of the stream, where possible. When replacing existing crossings, assess whether realignment of stream crossings is appropriate to reestablish historical or natural channels. Roadway storm drainage structures shall discharge away from stream crossings. Improve surfacing at stream crossings to prevent erosion and sedimentation;
  - vi. Areas disturbed due to road construction or maintenance activities shall be revegetated;

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<sup>22</sup> In some cases, designs may be needed to prevent aquatic passage, such as when providing passage would allow rainbow trout into brook trout waters.

- vii. Road work shall be timed to reduce impacts to resources and infrastructure, including recreational access; and
- viii. When conditions require closures to prevent resource and infrastructure damage, open roads shall be seasonally closed to the extent possible.
- TA-S-05** Maintenance levels of roads shall be compatible with the recreation development level.
- TA-S-06** While designing projects, determine if road management objectives (RMO) or maintenance level (ML) should change due to updated information, policy or public preferences such as: a determination that public use varies from planned use; fire suppression access or safety can be accommodated with a different RMO or ML; probable project and resource activity proposals do not depend on current RMO or ML for implementation; resource uses change; public safety becomes a concern; land movement occurs; sensitive soils or wetlands are impacted; resources are being impacted by traffic or forest users; or illegal uses are occurring.
- TA-S-07** Travel analysis is required when changes are considered to the transportation system, such as changes in vehicle class, traffic patterns and road standards. This can be accomplished either at the broadscale level via a forestwide analysis or at the project level. Until a forestwide TAR is complete, site specific analysis must be done; after the forestwide TAR is complete, responsible officials may determine whether travel analysis is needed in the project analysis area.
- TA-S-08** Temporary roads are located and constructed to minimize impacts to resources while providing short-term, single-purpose access, and are decommissioned when no longer needed, using techniques such as, but not limited to, removing drainage structures, re-contouring, and stabilizing the final slope.

## Guidelines

- TA-G-01** Unauthorized, unclassified roads should be considered for obliteration to prevent erosion and sediment transport, to restore natural contours, drainage patterns and vegetation. If a system road is found to be needed, a project level analysis will consider the potential to provide access.
- TA-G-02** Along trails and roads with existing populations of PET and SCC plant species, such as Virginia spiraea (*Spiraea virginiana*), glade spurge (*Euphorbia purpurea*), Smoky Mountain mannagrass (*Glyceria nubigena*), ash-leaved golden-banner (*Thermopsis fraxinifolia*) or Appalachian violet (*Viola walteri* var. *appalachiensis*), ground disturbance activities that displace plants should be minimized. Maintenance activities such as mowing and/or herbicide applications should be timed when the rare plants are dormant, unless the disturbance is beneficial.

## Management Approaches

When there are opportunities to change or improve the transportation system, the road system should be designed with these principles:

- i. Minimize the number of perennial, intermittent, and ephemeral stream crossings
- ii. Minimize the length of road crossings on poorly drained soils
- iii. Utilize existing road corridors as much as possible
- iv. Minimize the use of rights-of-way

- v. Minimize crossing MAs that exclude roads to access MAs that require additional access
- vi. Minimize new construction on known slide-prone areas

Consider daylighting and seeding roads and maintaining them as linear wildlife openings when appropriate for the management area, ecozone, and site-specific conditions.

## Facilities

### Background

Forest Service facilities offer resource program support and public service by providing work and meeting space, storage and repair areas, visitor information, operational bases, communications sites, utility support, and employee housing. The benefits of adequate facilities include job satisfaction (productivity, recruitment, and overall employee well-being), a healthy and safe environment for employees and the visiting public, effective use of space, service to the public, interpretation and preservation of significant historic buildings, protection of investments, and ability to meet key administrative initiatives.

### Desired Conditions

- FAC-DC-01** Facilities serve the needs of the Forests and its workforce and visitors, providing a healthy and safe work environment, sufficient meeting and storage space and visitor information where appropriate. They are maintained to serviceable condition, are energy efficient, meet Forest Service standards for accessibility, and are effectively and efficiently sized.
- FAC-DC-02** Sustainability concepts will be incorporated in new facility construction and facility renovation projects to the greatest practical level. Materials for construction and renovation projects include forest products and other locally sourced products if available and economical.
- FAC-DC-03** Facilities are located to effectively manage the Forests and resources.
- FAC-DC-04** Infrastructure blends into the natural and cultural landscape and complements the desired character and setting. Infrastructure and facilities are financially, ecologically, and socially sustainable. The facilities program is able to be maintained using resources available to the Forests.
- FAC-DC-05** Facilities that are no longer needed are identified for removal from the system or for decommissioning.

### Objectives

- FAC-O-01** Over the life of the plan, reduce total energy use across the Forests by at least five percent.

### Standards

- FAC-S-01** Historically significant facilities and structures shall be properly documented and managed to meet standards for historic preservation.
- FAC-S-02** All facilities shall be located to prevent contamination of groundwater and surface waters and to avoid impacts on aquatic habitat.
- FAC-S-03** Mitigation techniques, including screening, feathering, and other vegetation management techniques, shall be used to reduce impacts to scenery from facilities.
- FAC-S-04** New facilities are required to comply with scenic integrity standards and guidelines and minimize impacts to scenery when viewed from priority travel ways and use areas.

## Guidelines

- FAC-G-01** Facilities should be designed and maintained to minimize impacts to resources, including threatened and endangered species, heritage and cultural sites, watersheds, aquatic species, and vegetation. Where applicable, best management practices are implemented to reduce erosion and sedimentation.
- FAC-G-02** New administrative sites and facilities or expansions of existing ones should be located based on site-specific considerations of public safety and floodplain risk. When replacing or rehabilitating existing facilities that might be a floodplain risk, consider the feasibility of relocation outside of the floodplain and document rationale in project decision if relocation does not occur.
- FAC-G-03** Upon identification of issues or failures that result in resource damage or unsafe conditions, action shall be taken to correct or minimize impacts.
- FAC-G-04** Facility designs should reflect the natural and cultural landscape.
- FAC-G-05** A comprehensive facility maintenance plan for administrative facilities is kept current to identify facility needs and to steer facility management direction.

## Management Approaches

Operations and maintenance plans are kept current for all priority developed recreation sites and administrative sites.

Facilities will be designed, located, constructed, maintained, and operated in an environmentally responsible, resource efficient, and sustainable manner consistent with the agency's mission. The following methods will be used:

- i. Maximize the use of passive solar energy, ground heating and cooling, natural setting and vegetation, such as trees for shade and onsite or available renewable energy production.
- ii. Where practicable, convert waste streams into building materials, and utilize local, renewable building materials, including products of the Forests.
- iii. Perform building maintenance and operation to preserve sustainable design elements.
- iv. Provide long-lasting, functioning facilities while minimizing complexity of systems and maintenance required.
- v. Provide healthy and pleasant workspaces and living spaces that make use of natural lighting, minimize volatile organic compounds (VOCs), and maximize indoor environmental quality.



## Recreation Settings

### Background

Recreation is the most common portal through which people connect to the Nantahala and Pisgah National Forests. Outdoor recreation plays a significant role in serving the public and promotes physical, mental, and spiritual health; enhances community economy, identity, and sense of place; features the unique attributes of the Forests' special places; and fosters citizen stewardship of our public natural resources. The Nantahala and Pisgah National Forests are among the most visited forests in the country and provide visitors with unique opportunities for a wide range of recreational activities and experiences that provide economic support to surrounding communities. The Recreation Opportunity Spectrum (ROS) is a method used to categorize, evaluate, and monitor settings and opportunities based on the natural, managerial, and social environment. Desired recreation settings (or ROS classes) for each management area are spatially represented in an accompanying GIS layer, which was mapped based on a combination of data generated using the national ROS inventory mapping protocol, resource specialist and public input, and management intent for specific management areas.

The following section is divided into: Recreation Settings, which covers the broader range of recreation management and settings; Developed Recreation; and Dispersed Recreation.

### Desired Conditions

- REC-DC-01** Forest settings reflect healthy and resilient landscapes, provide a diverse sense of place for community residents and visitors, and connect people to the land through high-quality and safe sustainable recreation opportunities and valuable outdoor experiences. The Forests' recreation niches include sightseeing; water-based recreation (motorized and non-motorized boating, swimming, and other aquatic recreation activities); non-motorized trails for hiking, mountain biking, and pack-and-saddle; motorized trails; climbing and similar activities; remote backcountry experiences; hunting, fishing, and wildlife viewing; and conservation education.
- REC-DC-02** A range of recreation opportunities are available across the Nantahala and Pisgah National Forests in a variety of settings, from unmodified and remote areas to highly developed recreation sites. These lands and associated recreation amenities are managed for the following recreation settings as identified in management area desired conditions:
- *Primitive* settings encompass large, wild, and predominately unmodified landscapes. Their size and configuration create remoteness from the sights and sounds of human activities, management, and development. Signs and other structures are minimal and constructed of rustic, native materials. Motorized travel does not occur. Encounters with other users is very low, offering visitors the opportunity for solitude, self-reliance, closeness with nature, challenge, risk, and discovery. Many primitive settings coincide with designated wilderness areas in which mechanized equipment is not present. Additional primitive settings may also occur outside of wilderness areas. Mechanized travel and motorized equipment may occur in non-wilderness primitive settings.
  - *Semi-primitive non-motorized* settings are characterized by predominantly natural or natural-appearing landscapes. The size of these areas facilitate distance from more

heavily used and developed areas, creating a sense of remoteness. Interaction with other users is low. These settings provide opportunities for self-reliance and utilizing wildland skills. Motorized vehicles are not present, while mountain bikes and other mechanized equipment may be present. Although some roads may be evident, they do not dominate the landscape. Vehicular use is infrequent. Occasional administrative use occurs on these roads for the purpose of natural and cultural resource protection and management.

- *Semi-primitive motorized* settings are characterized as predominately natural or natural appearing backcountry settings. Motorized travel by off-highway vehicles (OHVs) or high clearance vehicles occurs on designated routes and areas. Motorized routes are typically maintenance level 0-2 roads or motorized trails, offering a high degree of self-reliance, challenge, and risk in exploring these large backcountry settings. Mountain bikes, other mechanized equipment, and non-motorized uses are also present. Limited rustic facilities are present for the purpose of visitor safety, sanitation, and resource protection.
- *Roaded natural* settings are characterized by predominately natural-appearing settings with moderate sights and sounds of human activities and development. The overall perception is one of naturalness. Evidence of human activity varies from area to area and may include improved highways and high maintenance level roads; developed campgrounds and other recreation sites; small resorts and summer homes; and evidence of other multiple uses and management activities such as livestock grazing, timber harvesting, mining, watershed restoration activities, and oil and gas operations. Roads, motorized equipment, and vehicles are common in this setting. Non-motorized uses are also present. The density of use is moderate except at developed sites, where concentrations of use are higher. Regulations pertaining to user behaviors are common but generally less restrictive than those in the Rural and Urban ROS classes.
- *Rural* settings are characterized as modified natural environments. While these landscapes often contain geometric patterns created by management activities, there is a dominant sense of open, green space typically characterized as pastoral farm and ranch lands. Facilities are common and may include resorts and summer home complexes; administrative sites and work centers; and highly developed campgrounds, interpretive sites, trailheads, picnic areas, and other recreation facilities. The sights and sounds of human activity and management are readily evident, and the level of interaction with other users ranges from moderate to high.

- REC-DC-03** The Forests provide high quality wildlife-based recreational opportunities, including hunting, fishing, and wildlife viewing. Wild and stocked recreational fishing continue as popular recreational activities in waters where those opportunities are not in conflict with the recovery of native species.
- REC-DC-04** A sustainable road and trail network provides access to hunting, fishing, and other recreation activities that connect people with nature.
- REC-DC-05** Access to water is available for water-oriented activities, including fishing, motorized and non-motorized boating and other water sports. Access points are located in areas

that provide safe, reliable access for users and do not degrade water flow and aquatic habitat and resources.

- REC-DC-06** Recreation use occurs within the ability of the site to support it with high visitor satisfaction, minimal conflict between users, and without impacts to the environment.
- REC-DC-07** Dispersed recreation sites with rustic site improvements and defined use areas (development scale 1 – 2) are provided primarily for resource protection. Designed sites with rustic or contemporary improvements in developed recreation sites (development scale 3 – 5) are provided for both resource protection and user comfort and convenience.
- REC-DC-08** Recreation settings retain their natural character as development and populations in the region continue to grow and new forms of recreation emerge.
- REC-DC-09** The Forests are free from graffiti, litter and other activities and objects that deface the natural character of the landscape and recreation settings.
- REC-DC-10** Resources, skills, energy, and enthusiasm of partners and communities are engaged to maintain or enhance recreation settings on the Forests.
- REC-DC-11** Recreation activities across the Forests contribute to the sustainability of the social and economic values of local communities through jobs and income in the local economy, community stability or growth, and the quality of lifestyles in the area.
- REC-DC-12** An array of high-quality accessible recreation opportunities are available to persons of all ability and experience levels, including those with disabilities.
- REC-DC-13** Recreation areas are inviting and inclusive of a culturally diverse population, engaging to youth, welcoming to under-served public, and responsive to shifting demographics.
- REC-DC-14** Accurate high-quality visitor information is available through multiple sources, including Forest Service and concessionaire employees, partners, volunteers, electronic media, and onsite information boards, to enhance visitor safety, experiences, resource protection, and to reduce user conflict.

## Objectives

- REC-O-01** Tier 1: Move toward a more ecologically, socially, and economically sustainable developed recreation program by:
  - i. Implementing collaborative recreation planning with stakeholders and local communities to develop a strategic guidance and a shared vision for sustainable developed recreation for the future within five years.
  - ii. Improve visitor satisfaction by maintaining and operating priority developed recreation sites to a facility condition index of at least 90 percent and to National Quality Standards within 10 years.
- REC-O-02** Tier 1: Identify areas where surface-penetrating tools can be used for non-commercial mineral collection within three years of plan approval.

### *Management approach:*

The identification of non-commercial mineral collection sites and techniques (REC-O-02) will involve collaboration with mineral and rock collecting groups, volunteer

or partner organizations, and/or state or local governments with an interest in minerals and geology.

- REC-O-03** Tier 1: Establish a forestwide accident analysis system of cumulative fatalities to determine if additional safety measures and risk management may be appropriate within the planning period.

### **Standards**

- REC-S-01** Recreational metal detecting is allowed only in designated metal detecting areas.

- REC-S-02** Temporary placement of geocaches is restricted unless prior approval for placing a cache is obtained from the local district office. Geocaches cannot be placed within Wilderness areas; Experimental Forests; Wild and Scenic River corridors; or where they may damage sensitive resources, such as historical or archeological sites or in areas where such use is in conflict with other Forest uses. No soil disturbance or cutting of vegetation is allowed when placing or hiding a cache.

- REC-S-03** Non-commercial mineral collection, such as rockhounding, gem collection and gold panning for personal use, may take place on National Forest System lands where the activity is not restricted by mineral lease or Management Area direction. The following restrictions apply:

- i. Following the identification of areas where surface penetrating tools can be used for non-commercial mineral collection (REC-O-02), use of surface penetrating tools for collection is only allowed in identified areas.
- ii. Gold panning may be used in the bed of streams provided that no digging tools, including suction dredging, beyond pans are used and aquatic habitat is not adversely impacted.
- iii. Any disturbance to or removal of historical or archaeological artifacts is prohibited by federal law.
- iv. Fossil collection shall be in accord with Forest Service Paleontological Resources regulations (36 CFR 291).
- v. Authorization is required for non-commercial mineral collection for research purposes.

### **Guidelines**

- REC-G-01** Design and construction of new projects should follow the assigned Recreation Opportunity Spectrum classification.

- REC-G-02** Wildlife viewing is encouraged in areas that minimize disturbance to wildlife or other resource areas.

### **Management Approaches**

Use available FS recreation planning tools to move toward a more ecologically, socially, and economically sustainable recreation program.

In the design and construction of new projects, use the principles and guidelines of The Built Environment Image Guide for the National Forests and Grasslands (2001) so that recreation sites and

features fit within the context of the ecological, physical, and cultural settings of the Southern Appalachian vernacular.

Work collaboratively to guide development of program priorities, emphasis areas, and place-based recreation settings considering the unique role of the National Forests in the local communities and broader region. Collaborative efforts help promote a connection to place and foster a sense of stewardship.

A mosaic of funding sources (including grants, volunteers, permittees, partners, and concessionaires) is used to provide or enhance recreation opportunities, leveraging resources where possible.

The Forest coordinates with NC Wildlife Resources Commission and other partners and volunteers to manage habitat associated with hunting, fishing, and wildlife viewing.

Work collaboratively to identify ways that the agency and partners can mitigate existing damage and protect from future damage resulting from recreational use.

Places of special recreational significance are recognized and managed in a way that protects their unique settings and the sustainable place-based activities they support. (See “Geographic Areas” for more information.)

**See also:** Conservation Education and Interpretation, Developed Recreation, and Dispersed Recreation, and Public Involvement; Chapter 4: Geographic Areas

## Developed Recreation

### Background

The Forests manage a wide array of developed recreation sites and facilities that facilitate high quality recreation experiences which promote the visitor's connection with nature while maintaining the ecological function of the surrounding area. Developed recreation areas are designed sites with rustic or contemporary improvements with site investment and development provided primarily for resource protection and user comfort and convenience. ROS emphasis is on Roded Natural and Rural for areas with development scales 4 and 5.

Developed recreation facilities and programs are funded through a variety of sources. The majority of these funds consist of congressionally appropriated dollars as well as fees collected at recreation fee sites, while other funding sources come from our valued partnerships and grants. Each are important and integral to the support of operations, maintenance, facility improvements, and program administration.

### Desired Conditions

- REC-DC-15** Developed recreation areas are visually appealing and ecologically, socially, and economically sustainable. New sustainable design uses principles rooted in understanding ecosystem processes, considers a broad understanding of site conditions and how they might change in the future and accounts for the social and cultural aspects of a place. Existing developed sites are maintained and updated based on the overall sustainable recreation strategy.
- REC-DC-16** Developed recreation areas and the constructed facilities found within them are visually subordinate to the valued landscape scenery and are constructed and maintained to a development scale appropriate to the recreational opportunity spectrum class.
- REC-DC-17** Priority developed sites meet all national quality standards.
- REC-DC-18** At highly developed sites, well-maintained forest system roads and well-marked trails provide relatively easy access for users.
- REC-DC-19** Fisheries and wildlife habitat improvements and viewing opportunities compliment developed sites.
- REC-DC-20** Risk is appropriately managed at recreation sites based on development scale.

### Standards

- REC-S-04** Before site decommissioning occurs, analyze the impacts to visitor experience and other social components that would be a result of removal.
- REC-S-05** Post applicable public safety and resource protection messages onsite.
- REC-S-06** Developed and day use sites identified as prone to flash flooding shall be appropriately signed.
- REC-S-07** In developed recreation sites (campgrounds or roadside campsites), camping with horses and pack stock is restricted to designated and signed equestrian camping areas.

## Guidelines

- REC-G-03** New campsites and restrooms should be located based on site-specific considerations of public safety and floodplain risk. When replacing or rehabilitating existing facilities that might be a floodplain risk, consider the feasibility of relocation outside of the floodplain and document rationale in project decision if relocation does not occur.
- REC-G-04** Maintain trails in highly developed recreation areas to complementary maintenance levels (generally Trail Class 3-5).
- REC-G-05** When needed to protect soil and water resources, use steps, trail surfacing, fencing, or other techniques to control patterns of use.

## Management Approaches

Development of new infrastructure is not likely, and unsustainable sites may be closed in the future. All decisions are dependent upon collaborative evaluation of the critical success factors of sustainable recreation: shared vision, financially sustainable, visitor satisfaction, natural and cultural resource protection, and ability to manage effectively. Some sites may be reconfigured or altered to retain or improve visitor experiences while being financially sustainable.

The portfolio of available developed sites is gradually transitioned to a level and distribution that is predicted to be socially and financially sustainable based on the Forests' priorities and capacity and informed by public input. Facility maintenance decisions are prioritized to emphasize investments in sites that will be sustainable.

To help achieve financial capability, an emphasis should be placed on reducing the deferred maintenance backlog and/or modifying existing facilities and/or services. (Note: If needed, this could include reduced services; reduced development scale; reduced seasons of operations; and/or decommissioning).

Consider new recreation sites and significant improvements to existing sites when they can be sufficiently maintained and managed for long-term through a combination of agency and partner support and where they support niches identified in Geographic Areas.

Emphasize improving, modifying, and maintaining existing sites rather than building new ones.

Stabilize and restore areas to sustainable levels of use and condition when use is negatively affecting natural and/or cultural resources, public safety, or recreation experiences.

Implement sustainable recreation design using principles and guidelines set forth in the Forest Service Handbook and Manual. Implement best management practices, where applicable, to reduce erosion and sedimentation.

To minimize user conflict at equestrian campgrounds, provide educational information to non-equestrian campers about the designed use of the facility, equine behavior and visitor safety, and sharing the facility responsibly.

Utilize the most current agency guidance in managing equestrian campgrounds, including technical guides, whitepapers, design guides, etc.

Newly constructed or improved-upon developed recreation areas are compliant to the Architectural Barriers Act Accessibility Standards (ABAAS) as well as the Forest Service Outdoor Recreation Accessibility Guidelines (FSORAG).

Bear-proof trash receptacles and/or food storage devices should be installed at sites where bears are known to frequent and as funding is available. Decisions on the need for such devices and the type

installed should consider the desired recreation setting. Where bear-proof trash receptacles are not provided, pack-it-in-pack-it-out practices should be encouraged through visitor education, and signage where appropriate, to reduce the potential to attract bears.

Emphasize use of native plant species when developing vegetation management plans or landscaping in developed recreation sites.

Cooperative agreements for law enforcement, and search, rescue, and recovery operations are developed and kept current through periodic review.

Frequency of patrolling, cleaning, and providing public contact is determined by development scale, amount of use, and national quality standards.

Vegetation management and other activities within developed recreation sites maintain the natural characteristics and are designed to:

- i. Enhance a diversity of both game and non-game wildlife habitats where wildlife viewing opportunities are desired,
- ii. Feature flowering trees, hard and soft mast bearing trees, fall color species, character trees and shrub species,
- iii. Create a mosaic of tree species of various densities and stem sizes,
- iv. Minimize impacts from insect or disease outbreaks,
- v. Rehabilitate areas damaged by insects or disease or overuse, and
- vi. Reduce risks to the public.



## Dispersed Recreation

### Background

Dispersed recreation occurs in all management areas and geographic areas and is managed to provide for a variety of opportunities and activities across all recreation settings. The combination of activity and setting allows for a broad range of user experiences, from backcountry angling in designated Wilderness to riding off-highway vehicle (OHV) trails. Access to dispersed recreation opportunities can be from Federal, state, or National Forest System (NFS) roads and trails, as well as waterways, climbing routes, or by cross-country foot-travel. With hundreds of miles of NFS trails for hiking, bicycling, horseback riding, and OHV use, access for dispersed recreation is provided to most management areas. In addition to trails, the network of NFS roads open to vehicular use allows motorized access to many parts of the Forests, while administratively closed, or “gated”, NFS roads often serve as connectors to equestrian and bicycle trails. Many of these “gated” roads are also managed as linear wildlife openings that enhance access and opportunities for hunting and wildlife viewing. Distributed throughout the Forests are numerous opportunities for other types of dispersed recreation, like climbing and similar activities, whitewater boating, swimming, long-distance trail backpacking, hunting, fishing, nature study, photography, primitive camping, car-camping at designated dispersed campsites, and many other activities.

### Desired Conditions

- REC-DC-21** Sustainable dispersed recreation use occurs within the ability of the land to support it, with high visitor satisfaction, minimal conflict between users, and without impacts to ecologically and culturally sensitive areas.
- REC-DC-22** An ecologically, socially, and financially sustainable system of trails provides high quality recreation experiences across a range of settings for each use-type.
- REC-DC-23** Unsustainable trails are transitioned to a sustainable condition utilizing current trail design principles or are decommissioned.
- REC-DC-24** Unauthorized trails are closed and actions are taken to prevent erosion, restore vegetation, and discourage use; or they are improved to meet agency trail standards and added as system trails through collaborative planning.
- REC-DC-25** Connector trails enhance loop opportunities within the existing network, and, where appropriate, provide connections to communities or other public lands.
- REC-DC-26** Off-highway vehicle, equestrian, bicycle, and electronic-bicycle trail use occurs only on NFS trails designated for those uses or NFS roads where those uses are not in violation of regulation. Use of llamas, alpacas, mules, or other pack stock only occurs where equestrian (pack and saddle) use is allowed.
- REC-DC-27** Access and opportunities are provided for recreationists to participate in hunting and fishing activities, throughout the year.
- REC-DC-28** Sustainable trail planning and management is done collaboratively with interested stakeholders; such as recreation users, volunteer or partner organizations, user councils, community organizations, state or local governments, special use permit holders, etc.
- REC-DC-29** Trailheads are appropriately designed for their intended use and well maintained.

- REC-DC-30** Current trail information and maps are available at Development Scale 2-5 trailheads, at visitor information centers, and electronically; information is easily accessible, educates visitors about safety, and promotes a responsible user ethic regarding the environment and interaction with other Forest visitors.
- REC-DC-31** Nationally designated trails sustain the characteristics, conditions, and values for which they were established. (See Interface Management Area, Appalachian National Scenic Trail Corridor, or Heritage Corridors Management Area for more.)
- REC-DC-32** Designated dispersed campsites provide resource protection and are minimally developed with rustic amenities and few signs.

## Objectives

- REC-O-04** Tier 1: Complete Trail Management Objectives (TMOs) for all Nantahala and Pisgah National Forest System trails within three years, and schedule trail maintenance tasks according to frequencies identified in the TMO.
- REC-O-05** Tier 1: Eliminate at least 10 percent of off-highway vehicle trail deferred maintenance annually; accomplished primarily through volunteers, fee revenue, and grants.
- REC-O-06** Tier 1: Increase trail miles meeting National Quality Standards to 50% over the life of the Plan.  
Tier 2: Increase trail miles meeting National Quality Standards to 60% over the life of the Plan.
- REC-O-07** (a) Tier 1: Within five years, begin collaborative trail planning to address equestrian and/or bicycle trail supply/demand issues to meet associated Goals in Bald Mountains, Black Mountains, Eastern Escarpment, and Highland Domes Geographic Areas.<sup>23</sup> (Also see: Geographic Area Goals BAM-GLS-10, BLM-GLS-09, EE-GLS-09 and HD-GLS-13.)  
(b) Tier 1: To help move the trail system to a more sustainable condition forestwide, conduct collaborative trail and trailhead planning across all geographic areas every five to seven years, building on the Nantahala and Pisgah National Forest Trail Strategy.

*Management Approach: Collaborative trail planning at a geographic area or ranger district scale could address deferred maintenance needs, structure repair or replacement, new trail construction or decommissioning, connectors and loop trail opportunities, unauthorized route adoption or closure, resource damage, trailhead parking, user conflicts, user education and trail etiquette, effective utilization of volunteers and partnerships, and procurement of grants or other non-allocated funding for trail construction and maintenance. This could be done for each trail complex identified in the Trail Strategy. Planning discussions could take multiple forms and could consist of public meetings for each geographic area or ranger district every five to seven years, a series of ongoing stakeholder meetings, or public engagement in conjunction with other project or landscape level planning efforts where sustainable management of hiking, bicycle, and/or equestrian trails is the focus. Collaborative trail planning may include key representatives of stakeholder*

<sup>23</sup> Standard REC-S-11 will be implemented forestwide through a Forest Supervisor order after collaborative trail planning identified in Objective REC-O-07(a) has been achieved and associated Geographic Area Goals have been completed.

*groups, volunteer or partner organizations, user councils, community organizations, special use permit holders, and/or state or local governments with an interest in sustainable trail management.*

- REC-O-08** Tier 2: Provide 10 new loop trail opportunities by creating connectors to existing National Forest System trails or gated roads over the life the plan.
- REC-O-09** Tier 2: Over the life of the land management plan, develop a Nantahala and Pisgah National Forest climbing management plan in collaboration with representatives of the climbing community. The climbing management plan should utilize inventories of climbing routes, access trails, staging areas, and other information provided by users to develop area-specific management direction following the latest agency policy on climbing and similar activities. The climbing management plan should consider user desires to improve the climber experience, identify access trails suitable for addition to the system, explore climber education opportunities, identify site-specific resource protection measures and potential closures, and develop monitoring protocols.
- REC-O-10** Tier 1: Develop an operation and maintenance guide for all designated dispersed campsites containing provisions for public health and safety and protection of water, aquatic, and riparian resources.

## Standards

- REC-S-08** If unacceptable damage to natural or cultural resources is occurring or safety issues are identified on a trail, temporarily mitigate impacts or close the trail (or trail segment) until planning and implementation can occur to correct issues, relocate, or decommission the trail.
- REC-S-09** Do not allow primitive or designated dispersed camping in areas where such use is in conflict with other Forest uses or creates resource damage; mitigate impacts, relocate, and/or close and rehabilitate campsites. For example, camping is not allowed in maintained wildlife openings.
- REC-S-10** Hiking (foot travel, pedestrian) is allowed anywhere on the forest, unless the area or route is closed by Forest Supervisor order.
- REC-S-11** Equestrian (horse, stock, pack, and saddle) and bicycle use is only allowed on system trails designated for those uses, and on open or gated system roads;<sup>24</sup> unless the road is closed to those uses by Forest Supervisor order. Equestrian use is allowed for big game retrieval in hunting seasons identified by the State.
- REC-S-12** Motorized trail use (Off-Highway Vehicles), including electronic bicycle use, is only allowed on NFS trails and roads designated or managed for that use as identified on published Motor Vehicle Use Maps, within the season of operation, and in compliance with any use fees that may exist.
- REC-S-13** Design, build, and maintain trails for their intended use and desired experience; when improving existing NFS trails, conform to agency Trail Design Parameters to the extent possible.

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<sup>24</sup> Standard REC-S-11 will be implemented forestwide through a Forest Supervisor order after collaborative trail planning identified in Objective REC-O-07(a) and associated Geographic Area Goals have been completed.

- REC-S-14** New trail construction, or adoption of unauthorized routes as system trails, must meet conditions 1-3 below. See exceptions for trail relocation and connectors in REC-S-15.
1. Proposed trails have been identified through collaborative trail planning between the Forest Service and interested stakeholders, such as recreation users, volunteer or partner organizations, user councils, community organizations, special use permit holders, state or local governments, etc.
  2. (a) One or more volunteer or partner organizations commit to long-term maintenance of proposed trails through an agreement; or  
(b) Proposed trails resolve critical health and safety needs, or supply/demand issues identified in geographic area goals; or  
(c) New trail mileage will be offset by a comparable length of existing system trail decommissioning, or unauthorized route closure of at least twice the length.
  3. Proposed trails are found to be ecologically, socially, and financially<sup>25</sup> sustainable and must utilize current trail design principles, avoid adverse impacts to natural and cultural resources, and not create user conflicts.
- REC-S-15** Relocation of unsustainable system trails, regardless of length, or construction of new connector trails of less than ½ mile to create loop opportunities, are not subject to REC-S-14 conditions 1 and 2 but must conform to condition 3. Relocated trails or trail segments may be longer than those being replaced, potentially resulting in a net increase of system trail miles. Abandoned trail segments shall be decommissioned to prevent continued resource damage and discourage use, unless sustainability can be addressed by repairs and changing designated use to hike-only.
- REC-S-16** New motorized OHV trail miles shall only be developed to mitigate safety issues or resource damage within existing OHV trail systems. *(Note: Electronic bicycle trails are an exception to this standard, but direction in REC-S-14 must be followed.)*
- REC-S-17** Designation of trails for electronic bicycle use shall only be done following the latest agency guidance and site-specific analysis supporting sustainable trail management.
- REC-S-18** Newly constructed or improved trails are compliant with Forest Service Trail Accessibility Guidelines (FSTAG).
- REC-S-19** Until completion of a climbing management plan per REC-O-09, implement the following:
- (a) New trails or climbing routes shall not traverse unique habitats or NRHP eligible, unevaluated, or sacred cultural resource sites on rocky summits, granitic domes, cliffs, or waterfall spray zones.
  - (b) Where existing trail use or climbing routes are impacting unique habitats or NRHP eligible, unevaluated, or sacred cultural resource sites, climbing routes shall be closed, unauthorized trails shall be obliterated, NFS trails shall be

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<sup>25</sup> Financial sustainability should consider available resources for initial construction and long-term maintenance, such as agency allocated funding, fee or permit revenue, grants, endowments, contributions from volunteer or partner organizations, etc.

decommissioned or relocated, or other protective measures must be implemented to mitigate resource impacts.

- REC-S-20** Do not allow new trails or relocations into or through Southern Appalachian bogs.

### **Guidelines**

- REC-G-06** Mixed use non-motorized trails are acceptable but should be accompanied by educational efforts to reduce user conflicts. All user groups should be encouraged to share responsibility and work together in supporting the trail.
- REC-G-07** Motorized trails should not have mixed use with equestrians, and bicycles or hiking are not encouraged. Trails may be dually designated for conventional and electronic bicycle use if consistent with current agency guidance.
- REC-G-08** Along trails and roads with existing populations of PET and SCC plant species, ground disturbance activities that displace plants should be minimized. Maintenance activities such as mowing and/or herbicide applications should be timed to minimize adverse effects to rare plants.

### **Management Approaches**

Priority of trail improvement or relocation projects shall be given to those trails with user safety or resource damage issues, recurring user conflicts, or needs identified through a trail strategy or other collaborative planning process.

Prior to re-designating hike-only trails to allow bicycle, electronic bicycle, or equestrian use, collaborate with key representatives of affected partner organizations or maintainer clubs, and consider conformity with applicable Trail Design Parameters, social and ecological impacts, user conflicts, and trail suitability for the proposed use in the project analysis.

Emphasis is placed on maintaining existing motorized trails to standard rather than creating new motorized trails. Trail improvements, relocation, and/or short connectors within an existing trail system may be constructed to more effectively address resource concerns, visitor safety, or improve alignment for sustainability.

New trail construction will be given higher priority if the trail has an agreement for long-term trail maintenance responsibilities signed with a partner organization that includes compliance reviews and provisions to consider the trail(s) for decommissioning if partner maintenance responsibilities are not fulfilled.

The following attributes are used as indicators of trails that are of higher priority to manage and maintain:

- i. Nationally designated trails, such as the Appalachian National Scenic Trail, National Recreation Trails, and National Historic Trails.
- ii. Day use hiking opportunities, particularly those associated with high visitation such as scenic overlooks and waterfalls.
- iii. The existing network of designated motorized trails to the extent they are sustainable using fees and grant funding (this does not include 4WD/high-clearance vehicle use of low maintenance-level NFS roads).
- iv. Mountain bike, equestrian, and hiking trails as further prioritized by collaborative trail planning.

Emerging recreation uses will be addressed using future agency direction and policy.

## Scenery

### Background

The Forests contain picturesque mountains, valleys, and rivers of great scenic beauty, with the majority of these Forests providing natural-appearing landscapes. Scenic landscapes are important to the quality of life, culture, and economies of western North Carolina. Combined, the two National Forests receive approximately 5.1 million visits annually. National Visitor Use Monitoring has shown that 53 percent of visitors to the Forests (approximately 2.5 million annually) engage in viewing scenery. The National Forests also provide much of the scenic backdrop for the Blue Ridge Parkway, a national park which receives approximately 13 million visits each year. The primary activity for 91 percent of these visitors (approximately 11.8 million) is viewing scenery. Highly valued scenic landscapes on these Forests also include lands visible from heavily used state, Forest Service, and National Scenic Byways; state parks and Forest Service recreation areas; popular reservoirs and rivers; and nationally designated trails, including the Appalachian National Scenic Trail.

The scenic and aesthetic values of the Forests were assessed using processes described in Agriculture Handbook Number 701, *Landscape Aesthetics: A Handbook for Scenery Management* (aka: the “Scenery Management System” or SMS). This process included creating an inventory of scenic classes derived from a combination of scenic attractiveness, viewer concern levels, and viewing distance zones. These scenic classes were then associated with desired scenic integrity objectives (SIOs) for each management area. Scenic and aesthetic values are maintained or achieved by meeting these desired SIOs which are classified as “Very High,” “High,” “Moderate,” or “Low.”

Ultimately, scenic integrity is a measure of the degree to which a natural or cultural landscape is visually perceived to be complete and intact and free from detractions from the natural or socially valued appearance. Over time, Forests landscapes have been shaped by human and natural forces, many of which still occur today.

Scenic (or landscape) character is a combination of the physical, biological, and cultural images that give an area its scenic identity and contribute to its sense of place. It also provides a frame of reference from which to measure potential changes in scenic integrity. Existing scenic character descriptions can be found in chapter 3 descriptions for each geographic area. These are characteristics to be retained as the desired scenic character. Additionally, desired scenic character themes for each management area describe a range of attributes from natural evolving to rural forested, for which scenic conditions on national forest lands are managed. These themes are associated with desired recreation settings identified for each management area and depicted spatially in a corresponding GIS layer. Geographic area desired scenic character and themes serve as a baseline reference for determining if desired SIOs can be met for proposed management actions.

The built environment, buildings, and other structures may be considered a valued landscape feature in terms of existing scenic integrity. When these features add to the sense of place or reflect the cultural legacy of an area, they contribute to scenic integrity. For instance, historic structures or well-designed campgrounds can enhance recreation opportunities and enjoyment of scenery.

Scenery resource management is a fully integrated part of ecosystem management. Project design and analysis with interdisciplinary teams using the best available technology will ensure scenic integrity is conserved, maintained, or enhanced to achieve desired conditions. Some areas of the Forests may require active management or restoration in order to move toward desired conditions. These activities may create openings or temporary deviations in an otherwise natural-appearing landscape, while in other areas the desired condition may be achieved primarily through natural processes.

## Desired Conditions

- SC-DC-01** The Nantahala and Pisgah National Forests provide many opportunities for viewing high quality scenery, rural/cultural sightseeing, and nature-based tourism. Numerous distinctively scenic and/or historic places of local or regional interest are available for people to enjoy, and the Forests offer outstanding opportunities for scenic viewing from trails, roads, rivers, lakes, and recreation areas.
- SC-DC-02** Scenic resources compliment recreation settings and experiences with a wide variety of visually appealing landscapes which are enjoyed by visitors.
- SC-DC-03** High quality scenery is emphasized where viewed from popular recreation destinations while retaining the distinctive scenic character and sense of place associated with the Nantahala and Pisgah National Forests as well as the Southern Appalachian region.
- SC-DC-04** The existing scenic character as described for geographic areas will be retained as the desired scenic character. National forest lands and infrastructure are managed to maintain the desired scenic character and conform to the following themes where identified as the desired scenic character for each management area:
- i. Natural Evolving landscapes exist where the natural evolution of biophysical features and processes occur with very limited human intervention.
  - ii. Natural-Appearing landscapes exist where the character is expressed predominantly by natural evolution, but there is also evidence of human intervention, including cultural features and processes.
  - iii. Rural Forested landscapes exist where a mixture of land uses occur in a predominately forested setting, but human alterations complement and blend with the natural environment. The built environment appears subordinate to and harmonious with the surrounding landscape and desired setting.
  - iv. Pastoral landscapes exist where human created or maintained pastures, “meadows,” “balds,” and possibly associated structures, reflect valued historic land uses and ecological conditions.
  - v. Cultural/Historic landscapes exist where the built environment and landscape features display the dominant attitudes and beliefs of specific human cultures and valued historic features represent events and periods of human activity.
- SC-DC-05** In areas with a SIO of “Very High,” the landscape is intact with only minor changes from the valued attributes in the desired scenic character. Human-created deviations, if any, create only minute visual disturbances. Only ecological changes are visible in natural landscapes, and cultural landscapes have complete visual intactness.
- SC-DC-06** In areas with a desired SIO of “High,” management activities are unnoticed, and the landscape appears unaltered. Human-created deviations may be present, but repeat elements of form, line, color, texture, and patterns within the characteristic landscape so completely and at such scale that the deviations are not evident.
- SC-DC-07** In areas with a desired SIO of “Moderate,” the landscape may appear slightly altered, and management activities may be noticeable, but they are visually subordinate within the characteristic landscape.



- SC-DC-08** In areas with a desired SIO of “Low,” the landscape may appear altered. Management activities may be evident and sometimes dominate, but they are designed to blend with surroundings by repeating form, line, color, and texture of valued attributes in the desired scenic character. Human-created deviations appear compatible with or complimentary to the characteristic landscape.
- SC-DC-09** Management activities visible in the foreground (FG) or middleground (MG) from the Appalachian National Scenic Trail, National Historic Trails, National Recreation Trails, Blue Ridge Parkway, or National Scenic Byways meet or exceed a Moderate SIO, regardless of scenic class or management area in which the activity is proposed. In some cases, a more restrictive SIO applies if specified in management area direction.

## Standards

- SC-S-01** All proposed actions which may visually alter scenic character must undergo a project-level scenery impact analysis of potential visibility considering associated viewpoints at use areas, water bodies, open roads, trails, and closed roads used as trails for project areas with a desired SIO of High, Moderate, or Low; and from any location within an area with a Very High SIO. The project-level scenery analysis must be conducted in leaf-off season or utilize a GIS viewshed analysis to determine the maximum extent of visibility.
- SC-S-02** Project activities shall be designed to meet or exceed desired SIOs.
- SC-S-03** For vegetation management actions, desired SIOs must be met in the following timeframes:
1. Very High – Within one full growing season
  2. High – Within two full growing seasons
  3. Moderate – Within three full growing seasons
  4. Low – Within four full growing seasons or as needed to achieve restoration goals that move forest ecozones toward desired conditions
- SC-S-04** Alteration of existing or construction of new recreation or administrative facilities or access routes may temporarily deviate from the desired SIOs or the timeframe required to meet them. However, project design must be appropriate for the desired recreation setting and consistent with guidance of the Built Environment Image Guide.
- SC-S-05** Unless project proposed actions clearly demonstrate a compelling need or benefit related to public health or safety, short or long-term changes to desired SIOs or timeframes to meet them may not occur. If such a compelling need or benefit related to public health and safety is essential to the project, desired SIOs may be adjusted or time frames to meet them extended to achieve the project purpose. However, project design must seek to blend activities with the natural environment by repeating elements of form, line, color, texture, pattern, and scale found within the characteristic landscape and must be approved by the Forest Landscape Architect or scenery management specialist.

## Guidelines

- SC-G-01** Manage scenic resources of the Forests landscapes and the built environment through application of the Scenery Management System (Agriculture Handbook 701); and to

achieve the desired scenic character, desired SIOs, and scenery standards identified for each management area.

- SC-G-02** Use the Nantahala and Pisgah National Forests' Scenic Class Inventory (GIS layer) as a reference to determine scenic classes within each management area (see management area direction for desired SIOs associated with each scenic class).
- SC-G-03** Use processes described in the Scenery Management System handbook to verify or identify adjustments to inventoried scenic classes. Adjustments to inventoried scenic classes may only be done to reflect changes in concern levels, scenic attractiveness, distance zones, and/or locations of travelways, use areas, or water bodies; or to rectify mapping errors in an existing inventory; and must be approved by the forest landscape architect or scenery management specialist.
- SC-G-04** When adjustments to scenic classes are needed, update the Nantahala and Pisgah National Forests' Scenic Class Inventory to reflect changes in concern levels, scenic attractiveness, distance zones, and/or locations of travelways, use areas, or water bodies; or to rectify mapping errors in an existing inventory. As the scenic class inventory is updated, desired SIOs in management area direction will then be determined by the updated scenic class.
- SC-G-05** Restoration activities and salvage operations resulting from uncontrollable natural occurrences (such as insect infestations, disease, or weather events) should be planned and implemented with consideration of desired SIOs identified for the associated management area and scenic class. Project design should seek to blend activities with the natural environment by repeating elements of form, line, color, texture, pattern, and scale found within the characteristic landscape.

## Management Approaches

The following process can be used to conduct a project-level scenery analysis:

- Reference the Nantahala and Pisgah NF Scenic Class Inventory map (GIS layer) to identify scenic classes for proposed treatment areas.
- Considering scenic attractiveness classification of the landscape being viewed, concern levels of potential viewpoints, and distance zones at which proposed activities would be seen, verify that the inventoried scenic class is mapped correctly. If a project-level adjustment to the inventoried scenic class is needed, consult with the forest landscape architect or scenery management specialist to update the Scenic Class Inventory, and provide justification and supporting documentation in the project scenery analysis based on principles of the Scenery Management System.
- For specific locations of proposed activities, identify the management area desired SIO(s) associated with the inventoried (or updated) scenic class(es).
- Review the "Scenery Treatment Guide for the Southern Region" to identify types of management activities which are consistent with desired SIO(s), and use this guidance to aid in designing project proposals.
- Conduct the project-level scenery analysis in leaf-off season or utilize GIS analysis to determine potential visibility of proposed actions. Identify viewpoint locations of all use areas, water bodies, open roads, trails, and closed roads used as trails within the

viewshed, then verify visibility (or partial visibility) of proposed treatments from each associated viewpoint.

- Design projects to ensure visible portions of proposed actions meet or exceed the desired SIO(s) as seen from identified viewpoints. Effects analysis typically considers topographic screening, vegetation screening, duration of view (moving or stationary), viewing position (above, below, oblique, etc.), desired scenic character, cumulative effects, and time required to meet the SIO. For more details on scenic classes, SIOs, and other principles of scenery management see: *Landscape Aesthetics: A Handbook for Scenery Management, Agriculture Handbook Number 701*.

## Cultural Resources

### Background

The unique and diverse environments of the Southeastern United States and the Southern Appalachian Nantahala and Pisgah National Forests have facilitated human occupation of the area for more than 10,000 years. Archeological sites associated with these populations are a record of human use, as well as environmental history that includes vegetation, animal species, and climate. The Forests preserve and protect cultural resources by complying with direction and processes set forth in but not limited to the following: National Historic Preservation Act of 1966, as amended 1988 (NHPA), National Environmental Policy Act 1969 (NEPA), Archeological and Historic Preservation Act of 1974 (AHPA), American Indian Religious Freedom Act of 1978 (AIRFA), Archaeological Resources Protection Act of 1979 (ARPA), and Native American Graves Protection and Repatriation Act of 1990 (NAGPRA).

The Nantahala and Pisgah National Forests strive to provide the link between past and present cultures, expand knowledge and understanding of the past, share the cultural and archeological resources with the public, actively care for the resources, participate in ecosystem management, and support on-the-ground project management activities.

Cultural Resources include the artifacts, archeological sites, historic structures, and built environments created by past inhabitants and those areas used or affected by them with their ways of life. Cultural resources documented on the Forests and surrounding areas have provided evidence for each one of the following periods and their related cultures: the Paleoindian (ca 12000+ to 8000 B.C.), the Archaic (ca. 8000 to 1000 B.C.), the Woodland (ca. 1000 B.C. to A.D. 1000), the Mississippian period (ca. A.D. 1000 to 1500), the Protohistoric-Contact period (ca. A.D. 1500 to 1700), European and American settlement period, and the more recent development period through the present.

The cultural resources of the Forests include a diverse and unusually rich range of archeological sites, traditional use areas, sacred places, and historic cultural landscapes including:

- i. Native American hunting, fishing, and gathering sites; temporary or seasonal habitation sites; stone tool workshops and quarries; more permanent villages, burial sites, trails, pictographs (painted), and petroglyphs (incised) that predate European contact.
- ii. Native American sacred and traditional sites.
- iii. Historic cabins, trails, mines, logging camps, railroad grades, farms and homesteads, mills, original highway grades, and cemeteries.
- iv. Historic Forest Service structures, including Civilian Conservation Corps-era campgrounds, roads, and buildings, as well as Forest Service guard stations, lookout towers, camps, and administrative centers.
- v. Historic landscapes.

Many of these properties and areas are unique and provide the only and/or best-preserved record of their former inhabitants and makers, ways of life, human behavior, adaptation, and change in Western North Carolina.

Cultural resources are inventoried and managed to protect their significant cultural, historical, and archeological values. Cultural resources listed or eligible for the National Register of Historic Places (NRHP) are maintained or restored. Cultural resources identified as Priority Heritage Assets (PHAs) have distinct public, tribal, and scientific values but are in unstable or deteriorating condition.

## Desired Conditions

- CR-DC-01** Significant cultural resource sites are preserved and protected for their cultural importance and managed to retain their historical, traditional, scientific research, and educational value.
- CR-DC-02** Priority Heritage Assets (PHA) are protected, preserved, and maintained.
- CR-DC-03** All known cultural resources are evaluated for eligibility to the National Register of Historic Places. Sites with intact scientific data are maintained to benefit the public, tribal, and scientific communities.
- CR-DC-04** Cultural resource protection efforts span boundaries to encompass collaboration with other government, public, and private partners.
- CR-DC-05** Artifacts and historic collections are properly accessioned, curated, archived, and preserved consistent with AHPA and Curation of Federally Owned and Administered Archeological Collections. Historic documents, including photographs, maps, journals, and program management records are available to the public and scholars for research and interpretation.<sup>26</sup>

## Objectives

- CR-O-01** Tier 1: Over the life of the plan, reduce deferred maintenance needs at archeological sites and historic structures by 50 percent and continue monitoring at current or higher level.
- CR-O-02** Tier 1: Over the life of the plan, reduce the backlog of site evaluations by 60 percent.
- CR-O-03** Tier 1: Within three years of plan implementation, identify archeological sites that are at high risk from looting impacts, and develop strategies for site protection and preservation.

## Standards

- CR-S-01** Formally consult with the N.C. State Historic Preservation Office (SHPO), tribes and Tribal Historic Preservation Officers (THPOs), and the Advisory Council on Historic Preservation (ACHP) as required in NHPA, NEPA, AHPA, AIRFA, ARPA, and NAGPRA.
- CR-S-02** Projects shall be designed to avoid, minimize, or mitigate negative effects on potentially significant cultural resources. In-place protection of identified sites is the minimum requirement until site significance is determined.
- CR-S-03** Protect cultural resources by completing cultural resource inventories, including field surveys and historic research, prior to ground disturbance or land transfer projects, as well as prior to management activities or designations that may have potential adverse effects. Formally consult with SHPO, tribes and THPOs, and ACHP as appropriate to identify and determine the significance of cultural resources and to resolve adverse effects.

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<sup>26</sup> If any historical documents contain information about human remains or funerary objects, this will be shared with tribes prior to a decision about sharing with the public and scholars.

- CR-S-04** For cultural resource projects, including archeological and historic investigations that may advance culture history and other tribal interests, ensure that such projects address these topics and involve methods preferred or agreed to by tribes through consultation.
- CR-S-05** Avoid disturbance of known cultural resources until evaluated and determined not significant.
- CR-S-06** Prescribe and implement necessary mitigation measures if site disturbance is necessary in consultation with N.C. State Historic Preservation Office, tribes, and the Advisory Council on Historic Preservation.
- CR-S-07** Cultural resources are protected from loss. National Register of Historic Places eligible and unevaluated sites are stabilized, treated, managed, and preserved for their historical, traditional, public, and scientific research value.
- CR-S-08** Maintain confidentiality of cultural resource information. Do not reveal locations in public documents or files unless agreed upon by all parties.

### **Guidelines**

- CR-G-01** Cultural resources should be managed according to their FS Management Use Allocation category, including preservation, enhancement-public use, or scientific investigation.
- CR-G-02** Antiquities and Archaeological Resources Protection Act permits should be issued only to qualified<sup>27</sup> academic institutions, other businesses, organizations, or individuals for the study and research of sites. Consult with appropriate parties, including State Historic Preservation Office, and Tribal Historic Preservation Offices, to agree upon methods and measures needed to mitigate potential adverse effects prior to conducting or permitting excavation at identified sites.

### **Management Approaches**

Site protection law enforcement protocols are in place to prevent damage or loss of cultural resources.

Follow the National Forests in North Carolina section 106 Programmatic Agreement Strategy for Unanticipated Discoveries and respective regulations to ensure inadvertent discoveries and emergency discoveries are reported and mitigation is developed through consultation with SHPO, tribes and THPOs, and ACHP.

If additional evidence or information regarding the eligibility of a cultural resource or historic property to the National Register of Historic Places becomes available, it will be re-evaluated.

Plan for mitigation of potential impacts to cultural resources from climate change, or weather events such as flooding.

Complete the Forest Heritage Program Plan.

Complete Historic Property Plan. Maintain and revise the Programmatic Agreement with State Historic Preservation Office and Tribal Historic Preservation Offices.

Maintain the Heritage NRM and GIS Databases.

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<sup>27</sup> Qualified institutions are those that meet Department of Interior or Office of Personnel Management X-118 standards.

Follow and regularly update programmatic agreements with State Historic Preservation Offices and Tribal Historic Preservation Offices.

**See also:** Tribal resources, Heritage Corridors Management Area

## Tribal Resources

### Background

Prior to European and American settlement, the lands presently included in the Nantahala and Pisgah National Forests were part of the Cherokee and Creek Tribal homelands. Federally recognized Native American tribes with historic ties and interests in the management of the Forests are consulted and often act as partners in cultural resource management and other resource programs.

The Cherokee Tribes include the Eastern Band of Cherokee Indians (Cherokee, NC), the Cherokee Nation (Tahlequah, OK), and the United Keetoowah Band of Cherokee (Tahlequah, OK). The Qualla Boundary of the Eastern Band of Cherokee Indians is located adjacent to the Nantahala National Forest. There are interspersed tribal land parcels and, in some cases, these are surrounded by NFS lands. There are more than 20 miles of Eastern Band of Cherokee Indians (EBCI) and Forest Service shared property lines. The EBCI has more than 56,000 acres of land in six counties (Clay, Cherokee, Graham, Haywood, Jackson, and Swain) of the 18 counties in the planning area.

There are 46 documented pre-contact and historic Native American towns within the Forests. Some of these towns have been reported as existing from the mid-1600s into the 1900s. Most locations continue to be occupied in the present. Archeological and ethno-historic evidence supports the locations of these towns. Approximately 791 miles of historic trails, many along present day routes, connected the towns within the designated geographic areas with around 146 miles of these trails located directly on the Forests lands.

The Catawba Indian Nation (Rock Hill, SC) has ties to the lands comprising the Grandfather Ranger District of the Pisgah National Forest. The Muscogee Creek Nation (Okmulgee, OK), Kialegee Tribal Town (Wetumka, OK), Thlopthlocco Town (Okemah, OK), Alabama Coushatta Tribe of Texas (Livingston, TX), Alabama-Quassarte Tribal Town (Wetumka, OK), Coushatta Tribe of Louisiana (Elton, LA), and Poarch Band of Creek Indians (Atmore, AL) have historic connections and current interests in the Forests. The Shawnee Tribe (Miami, OK) has shown interest in the present management of the Forests.

National Forests lands contain traditional cultural properties, sacred sites, traditional use areas, historic landscapes, and plant and animal species, with significant relevance to Native American cultural beliefs and lifeways. These are considered and managed for protection, preservation, and Native American use through formal consultation in compliance with historic preservation and civil rights regulations including but not limited to the National Historic Preservation Act of 1966, as amended 1988 (NHPA), National Environmental Policy Act 1969 (NEPA), Archeological and Historic Preservation Act of 1974 (AHPA), American Indian Religious Freedom Act of 1978 (AIRFA), Archaeological Resources Protection Act of 1979 (ARPA), Native American Graves Protection and Repatriation Act of 1990 (NAGPRA), and Executive Order 13007 Indian Sacred Sites of 1996.

### Desired Conditions

- TR-DC-01** Native American tribes and members retain a connection to the land that fosters both their traditional and contemporary cultural uses of the Forests. The Forests foster connections between displaced tribal members and their ancestral homelands.
- TR-DC-02** Tribes and tribal members are partners in managing the National Forests and its resources.



- TR-DC-03** Lands are guided by shared stewardship, including tribal and Forest Service lands and resources, to support healthy and resilient forests that benefit tribal communities and the public.
- TR-DC-04** Traditionally used resources are not depleted and are available for future generations. Sacred plants and trees are managed sustainably with tribal input and restored or reestablished when needed.
- TR-DC-05** Traditional tribal uses such as the collection of medicinal plants and wild plant foods are valued as important uses that are recognized and allowed within sustainable limitations.
- TR-DC-06** Traditional ecological knowledge from Native American tribes and other sources is considered and incorporated in forest management.
- TR-DC-07** The cultural landscape retains characteristic Native American elements, including archeological sites, former Cherokee town sites, historic trails, and other tribal use areas.
- TR-DC-08** Tribal members have access to sacred sites for individual and group traditional ceremonies. There are opportunities for solitude and privacy for ceremonial activities.
- TR-DC-09** Conflicts between Native American traditions and ceremonies and other forest uses are minimized.
- TR-DC-10** Strong relationships between Forest Service and tribal representatives are fostered and maintained with proper government-to-government levels of consultation and communication.
- TR-DC-11** The Forests provide a setting for the education of tribal youth in culture, history, and land stewardship and for the exchange of information between tribal elders and youth.
- TR-DC-12** All sacred objects, human remains, funerary objects, and objects of cultural patrimony removed from lands of the Forests have been repatriated to the appropriate tribe.

## Objectives

- TR-O-01** Tier 1: Within two years of plan implementation, complete a tribal communication plan to identify contacts and respective responsibilities, and a memorandum of understanding clarifying roles and authorities.
- TR-O-02** Tier 1: Within three years of plan implementation, develop a tribal partnership for restoration.
- TR-O-03** Tier 1: During the planning period, work with tribes and the Southern Research Station to identify research locations and collaboratively study sustainable plant harvesting, artisan resource management, and the use of traditional ecological knowledge.

## Standards

- TR-S-01** Formally consult with tribes as appropriate to identify and determine the significance of cultural resources.
- TR-S-02** For projects with the potential to further define the culture, history and/or restore traditional resources of tribes, ensure that such projects are developed in consultation with tribes.
- TR-S-03** Protect heritage resources for traditional and ceremonial purposes identified by tribes.

- TR-S-04** Restrict minerals activities at tribal traditional and ceremonial sites. Allow no surface occupancy.
- TR-S-05** Manage areas with significant tribal traditions and cultural properties or sacred sites (that are identified in consultation with tribes) to preserve and restore their inherent cultural values. Formal tribal consultation is completed prior to any management decisions and activities within these areas.
- TR-S-06** Maintain confidentiality of significant tribal traditions and cultural properties, traditional areas, and sacred sites. Do not reveal locations in public documents or files unless agreed upon by all parties.
- TR-S-07** Allow Forest use on a case-by- case basis for tribal traditional and ceremonial activities in areas that otherwise may be closed to public use.

### Guidelines

- TR-G-01** Activities and uses should be conducted in a manner that is sensitive to traditional Native American beliefs and cultural practices.
- TR-G-02** Temporary closure orders should be used to accommodate traditional use.
- TR-G-03** Development of integrated landscape projects should seek early input from federally recognized tribes and explore opportunities to reflect Traditional Ecological Knowledge in project design.

### Management Approaches

Provide training to forest employees about the trust responsibilities Federal agencies have for tribes and the specific ways in which the Nantahala and Pisgah National Forests honor and implement those responsibilities. Educate and train law enforcement officers and employees to protect rights of tribal members. Include tribal members and THPOs in the training to provide views and to enhance cultural sensitivity.

During tribal coordination, involve both natural resources staff as well as the tribal historic preservation office with an intent to support regular interdisciplinary involvement in project design.

Create opportunities to allow displaced tribal members to visit their ancestral homelands to learn and share about their heritage.

Foster opportunities to engage tribal members in management of forest resources such as through volunteering, tribal agreements, and training.

Engage with tribes on the opportunity to translate Forests interpretation and education materials and maps into native languages.

Engage with tribal natural resource staff to share knowledge and manage collaboratively.

Utilize collaborative and shared stewardship authorities to conduct work that benefits both tribal and National Forest System lands.

Coordinate with adjacent forests on tribal resource management.

**See also:** Water, Terrestrial Ecosystems, Cultural Resources, Non-Timber Forest Products, Heritage Corridor Management Area

## Non-Timber Forest Products

### Background

Non-timber forest products are products derived from any naturally occurring mushrooms, fungi, flowers, seeds, roots, bark, leaves, and other vegetation that grows on National Forest System lands. They exclude sawtimber, pulpwood, cull logs, roundwood, house logs, utility poles, minerals, animals, animal parts, rocks, water, and soil, but do include firewood. Non-timber forest products are collected for personal, educational, commercial, and scientific use. Within the Nantahala and Pisgah National Forests, they can be separated into four categories: medicinal and dietary supplements, edibles, specialty woods, and floral or decoratives.

### Desired Conditions

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|-------------------|--|
| <b>NTFP-DC-01</b> | Commercial and personal use collection of non-timber forest products occurs within sustainable harvest limits.   |
| <b>NTFP-DC-02</b> | Traditionally used resources availability is improved for future generations.  |
| <b>NTFP-DC-03</b> | Collaboration efforts and partnerships are ongoing with tribes to ensure the availability and sustainable harvest of important cultural and traditional plants.  |
| <b>NTFP-DC-04</b> | Forest products collecting and gathering is recognized and allowed as a traditional tribal use.  |
| <b>NTFP-DC-05</b> | American ginseng has large healthy reproducing populations typically with more than 500 individuals and occasionally with more than 1000 individuals. Older age classes within populations represent at least 40 percent of all the individuals. Genotype diversity within populations represent the Southern Appalachian types. |
| <b>NTFP-DC-06</b> | Galax bed sizes are diverse with numbers of leaves varying from 10,000 to more than 300,000 and dispersed across the eight ecozones in which it is commonly located. Young leaves, less than 1 inch in diameter, represent at least 25 percent of any population landscape wide.   |
| <b>NTFP-DC-07</b> | Ramp patches range in size from a quarter acre to three acres at bulb densities from 10,000-50,000 an acre. Juvenile bulbs represent 20-25 percent of a population.  |
| <b>NTFP-DC-08</b> | A diversity of woodland medicinal herbs is present within appropriate habitats at historical densities.  |

### Objectives

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|------------------|---|
| <b>NTFP-O-01</b> | Tier 1: Every two years, assess at least one non-timber forest product to ensure sustainability and stable populations for species with high harvest rates or biological susceptibility such as American ginseng, ramps, galax, and Fraser fir. |
| <b>NTFP-O-02</b> | Tier 1: Annually, continue to produce local ginseng seeds in the nursery and augment or establish at least ten ginseng populations with southern Appalachian germplasm (seeds or transplants) over the life of the plan.                        |

## Standards

- NTFP-S-01** Only allow collection of products at sustainable harvest rates as confirmed by forestwide monitoring.
- NTFP-S-02** Do not allow collection of moss species except for scientific purposes.
- NTFP-S-03** Do not allow collection of the following showy species: azaleas, lilies, orchids, and trilliums.
- NTFP-S-04** Collection within 30 feet of a perennial or intermittent stream is limited to those species, such as yellowroot (*Xanthorhiza simplicissima*), that cannot be feasibly collected on upland sites. For species collected within this zone, collection is limited to a maximum of 50 plants per permit for any ground disturbing activities (transplants, roots), and only one permit is issued per individual each month.
- NTFP-S-05** Collection of down fuelwood without a permit is allowed for on-site camping use only.

## Guidelines

- NTFP-G-01** Utilize associated indicator species for determining site locations for establishing new American ginseng populations.
- NTFP-G-02** Do not allow motorized access to collect products behind locked gates.
- NTFP-G-03** Tribal traditional use of medicinal plants and other botanical resources should take priority over commercial harvesting.
- NTFP-G-04** When gathering does not impact sustainable plant populations, ensure personal gathering use of plants by tribal members is not hindered.

## Management Approaches

Continue to partner with the Southern Research Station and others to identify sustainable harvest rates and limits for collected products.

Utilize an adaptive management approach for sustainable harvest rates tiered to a series of monitoring stations.

Develop and update value and rate schedules for all products. Standard rates are to be updated or verified annually for those products that are not sold under competitive procedures.

Coordinate with adjacent units to provide consistency in standard rates and permit conditions for common market areas.

**See also:** Tribal Resources, Lands and Special Uses

## Minerals and Energy

### Background

Minerals and energy from the National Forests are part of ecosystem services and part of the Forest Service's multiple use mission. Congress enacted various laws requiring the management of federal mineral resources on national forests including laws providing for mineral exploration and development. National Forests System (NFS) lands are congressionally available for mineral resources unless Congress withdraws specific areas, such as Wilderness, from federal mineral laws. There are two types of federal mineral resources on the Forest: 1) mineral materials and 2) leasable minerals.

The Forest Service has the authority and responsibility to manage federal mineral materials. Mineral materials include aggregate, rip rap, gabion rock, building stone, landscaping rock, and other rock or earthen construction materials. The Forests use mineral materials to construct and maintain roads, developed recreation sites, trailheads, aquatic passages, watershed protection, and restoration projects. The Forests' mineral materials resources are also in demand for public work projects and rural economic development. The Forests can provide mineral materials to the public for commercial or non-commercial use.

Federal leasable minerals on acquired lands include hardrock minerals (such as precious metals, base metals, and non-metallic minerals) and energy resources (such as geothermal, natural gas, and oil). The Forests' primary potential is for hardrock minerals. The Nantahala and Pisgah are endowed with a unique and rich diversity of mineral occurrences unmatched by other national forests east of the Mississippi. The Forests' mineral potential includes critical minerals required for climate change mitigation.

Management of federal leasable minerals on NFS lands is a shared responsibility between the U.S. Department of Interior, Bureau of Land Management (BLM), and the U.S. Forest Service. The BLM has the authority to issue licenses, permits, and leases for exploration and development of federal leasable minerals. The Forest Service has the authority to consent or not consent to proposed licenses, permits, and leases to explore and develop federal leasable minerals.

The Forests coordinate with the BLM to lease subsurface mineral resources, including a hardrock mineral lease and potential development for olivine in Clay County.

When an applicant applies for a BLM authorization to explore or develop federal leasable minerals, the BLM conducts an initial review to confirm that the application includes required information. BLM then sends the application to the Forest Service and inquires whether the Forest Service consents to the BLM authorization requested by the applicant. The Forest Service, in cooperation with BLM, would then conduct an environmental analysis with public involvement (NEPA process) for the proposed project.

If the Forest Service decides to consent to the BLM authorization, the consent would be conditioned by Forest Service requirements or stipulations that BLM would add to the license, permit, and lease to ensure that impacts on resources are mitigated and that the affected land is reclaimed. Even if the Forest Service decides to consent, the BLM would make its own independent decision on whether to issue the authorization. If the Forest Service decides not to consent to the BLM authorization, BLM could not issue the authorization.

The federal government has acquired many land tracts to create the Nantahala and Pisgah National Forests. Some of those tracts have outstanding or reserved mineral rights. These non-federal mineral estate owners have the right to exercise valid existing mineral rights.

## Desired Conditions

- MIN-DC-01** The Forests' mineral materials resources (e.g., aggregate, rip rap, gabion rock, building stone, landscaping rock) support building and maintaining trails, roads, campgrounds, and watershed improvement projects; controlling erosion and sedimentation; restoring riparian and aquatic habitat; preventing or repairing flood damage; sustaining the Forests' infrastructure; and meeting public use demand and other governmental agency needs.
- MIN-DC-02** Opportunities are provided for minerals and energy production in an environmentally sound manner to meet current and future needs, including critical minerals for renewable energy technology and climate change mitigation infrastructure.
- MIN-DC-03** Reclamation maintains or enhances other forest resources.
- MIN-DC-04** Abandoned mine lands are reclaimed to provide for public safety and to minimize impacts to cultural and natural resources.
- MIN-DC-05** Opportunities for rockhounding and other types of non-commercial mineral collecting (e.g., for recreational, scientific, or educational purposes) are available and managed to protect natural resources and public health and safety.
- MIN-DC-06** Renewable and non-traditional energy opportunities are considered, such as biomass, firewood, hydropower, geothermal, wind, and solar.

## Standards: Federal Leasable Minerals

- MIN-S-01** When providing consent to the Bureau of Land Management (BLM) for leasable mineral exploration or development, the consent shall include any requirements for environmental protection. Federal leasable mineral exploration and development shall be conducted in a manner that minimizes adverse impacts to the land, air, and water, to cultural, biological, visual, minerals, and other resources, and to other land uses or users. Lease stipulations and conditions of approval for operations may include, but are not limited to, modification to proposed siting or design of facilities, timing of operations, and specification of interim and final reclamation procedures.
- MIN-S-02** Reclamation should be timely and appropriate to the mining method employed.
- MIN-S-03** Commercial removal of leasable minerals on acquired lands requires a mineral lease from the BLM. All Federal lands on the Nantahala and Pisgah National Forests are acquired lands.

## Guidelines

- MIN-G-01** Consider federal leasable mineral management when developing Forest Service surface resource management activities (including projects, designations, grants and agreements, special uses, recovery plans, restoration plans, research projects, and interagency agreements), and coordinate with BLM where needed.
- MIN-G-02** Consultation should occur with the North Carolina Geological Survey, the United States Department of the Interior's Geological Survey, the Bureau of Land Management, and the United States Department of Energy on activities impacting minerals and energy resources.

### **Standards: Forest Service Managed Mineral Materials**

- MIN-S-04** The selection, design and development of Forest aggregate sources and the use of aggregate from the Forests and private sources on Forest Service system roads should meet Federal standards for airborne asbestos.
- MIN-S-05** Boulderfields shall not be permitted for any rock removal, unless for scientific research that would benefit management of the unique habitat.

### **Standards: Rockhounding and Other Non-Commercial Mineral Collection**

See Recreation: Settings

### **Standards: Reserved and Outstanding Mineral Rights**

- MIN-S-06** The forest plan, including management prescriptions and forestwide direction, is subject to outstanding and reserved mineral rights.
- MIN-S-07** The location of proposed management activities shall be screened for the presence of reserved or outstanding mineral rights.

### **Management Approaches**

The decision regarding oil and gas availability is outside the scope of the forest plan revision and will be revisited at the time that a request for leasing is made.

Plans of operations and reclamation would include a schedule of activities; an estimate of the amount of material to be removed; and measures for stabilizing soil, protecting water quality, restoring vegetation and wildlife habitat, protecting visual quality, and protecting Native American sites and other cultural resources.

A pit development plan would be prepared for large or multiple-entry aggregate sources to ensure efficient use of aggregate resources and avoid adverse environmental effects.

When the Forests receive a BLM request for consent to a BLM authorization for critical minerals, the Forest Service gives the request priority consideration, including due diligence in conducting an environmental analysis in cooperation with BLM in order to make a consent decision in a timely manner.

## Conservation Education and Interpretation

### Background

The Nantahala and Pisgah National Forests provide conservation education and interpretation opportunities to connect people with nature. Conservation Education and interpretation are two important niches of the Forests. Increasing public understanding of underlying issues is crucial to successful public policy; is an investment to promote sustainable use and enjoyment of natural resources; and prevents costly impacts to forest resources. The guiding principle is that conservation education and interpretation will increase environmental literacy in the interest of sustainable resource management and will be integrated as a component in all program areas.

### Desired Conditions

- CE-DC-01** Conservation education and interpretation is integrated as a component in all program areas to facilitate public understanding of the resources and their management.
- CE-DC-02** Interpretation and conservation education opportunities connect people with nature and enhance the public understanding and appreciation for the natural, cultural, tribal history, and the multiple-use mission of the Forests. Conservation education programs and activities contribute to connecting people to the land and to each other.
- CE-DC-03** Conservation education and interpretation is culturally inclusive, engages diverse audiences, and invites diverse visitors to the Forests.
- CE-DC-04** Accurate, high quality visitor information is available through multiple media sources with an emphasis on consistency, accessibility, convenience, and quality and enhances visitor experience and safety.
- CE-DC-05** Through a variety of educational and interpretive efforts, people learn about biodiversity; botanical communities; wildlife and aquatic species; ecosystems; tribal, heritage, and other cultural sites; hunting and fishing heritage; and geology resulting in a motivation to practice careful stewardship. Education themes include sustainability, safety, and user ethics, and support National Forest Service education themes.
- CE-DC-06** Conservation education and interpretation efforts emphasize a land ethic that informs how to reduce impacts on ecosystems and supports the Forests' efforts to protect natural resources.
- CE-DC-07** Low impact recreation principles, such as "leave no trace" and "tread lightly," are promoted and widely used by the public.
- CE-DC-08** Forest Service employees promote a connection to place, foster a sense of stewardship, and help move the Forests toward sustainable conditions through education efforts and partnerships.
- CE-DC-09** Partners assist the Forests in delivering interpretation and education that instills and promotes conservation and stewardship.

### Objective

- CE-O-01** Tier 1: Annually, educational and interpretive efforts will expand the suite of programs offered through revisions of existing programs and/or additions of new programs. These



programs will address management needs and will also emphasize efforts for providing youth or underserved populations with a better understanding of their natural and cultural environment.

### **Management Approaches**

Educational programs and materials are developed or certified by the Forest Service to incorporate the best scientific knowledge; are interdisciplinary and unbiased; support the Forest Service mission; and are correlated with appropriate national, state, and agency guidelines.

Education and management actions address visitor safety.

Educational materials addressing project objectives, such as promoting the principles of sustainable timber harvest, wildlife habitat improvement, and ecological restoration, as examples, are provided to the public in coordination with project design and implementation. Working with interested partners, signage will be developed and posted to educate the public about project goals, management approaches and other needed messaging.

Provide information kiosks that include messaging needed for the area while minimizing visual clutter by concentrating messages and eliminating the need for multiple signs. Kiosks will be utilized to educate visitors about nearby projects.

Consider use of both emerging and traditional technologies to reach target audiences efficiently and effectively.

To expand capacity to deliver conservation education, build working relationships with other Federal and state agencies with a conservation mission; public, private schools, and universities; and non-profit organizations; and maintain memberships with professional resource management and educational associations. Manage the conservation education and interpretive services programs to avoid duplication with other providers whether in public or private sector.

Build relationships with community programs that help ensure the delivery of public services reflects the diversity of the American public. When promoting conservation education, encourage participation by urban and rural communities, tribes, youth, minority, and low-income populations.

Expand educational programs to reach more youth. For example, in classrooms and at sites across the Forests, ensure that programs provide youth of all ages and backgrounds meaningful educational experiences of the highest quality.

Subject matter pertaining to tribes is collaboratively developed and, in appropriate cases, is also in tribal language. Opportunities to share tribal history and connections to the forest are incorporated into education efforts when desired by tribes.

Initiate and facilitate the cooperation of local organizations and providers in developing and implementing education relating to use and/or prevention of fire.

Partner in the delivery of programs on natural resource management for the USDA Job Corps Centers in North Carolina.

**See also:** Public Involvement, Community Connections, Experimental Forests and Research Natural Areas, Cradle of Forestry

## Chapter 3: Geographic Areas

Places matter. While the forestwide section of the plan provides direction that is consistently applied across the forest, there are also some differences based on the unique sense of place. By separating the Forests into distinct landscapes, the forest plan will recognize the opportunities for restoration and sustainable recreation opportunities, connections to nearby communities, and opportunities for partnerships with the public, other organizations, and governments in each part of the Forests. These distinct landscapes are known as geographic areas, and they allow the plan to describe each part of the Forests as it relates to our themes – Connecting People to the Land, Sustaining Healthy Ecosystems, Providing Clean and Abundant Water, and Partnering with Others. Each geographic area also has goals identified that will serve as emphases for management during plan implementation.

Geographic areas contain management areas within them. They work in combination with forestwide direction (chapter 2) and management area direction (chapter 4) to provide guidance during plan implementation.

### What are the geographic areas on the Nantahala and Pisgah Forests?

There are 12 geographic areas on the Nantahala and Pisgah National Forests. They cross ranger district and county boundaries, as they are divided by landscape features. They include: Bald Mountains, Black Mountains, Eastern Escarpment, Pisgah Ledge, North Slope, Highland Domes, Great Balsam, Nantahala Mountains, Nantahala Gorge, Fontana Lake, Hiwassee, and Unicoi Mountains.

### How were geographic areas defined?

These geographic areas were defined by scenic character and public use. First, boundaries were informed by landscape characteristics including geologic features, topography, hydrology, and water

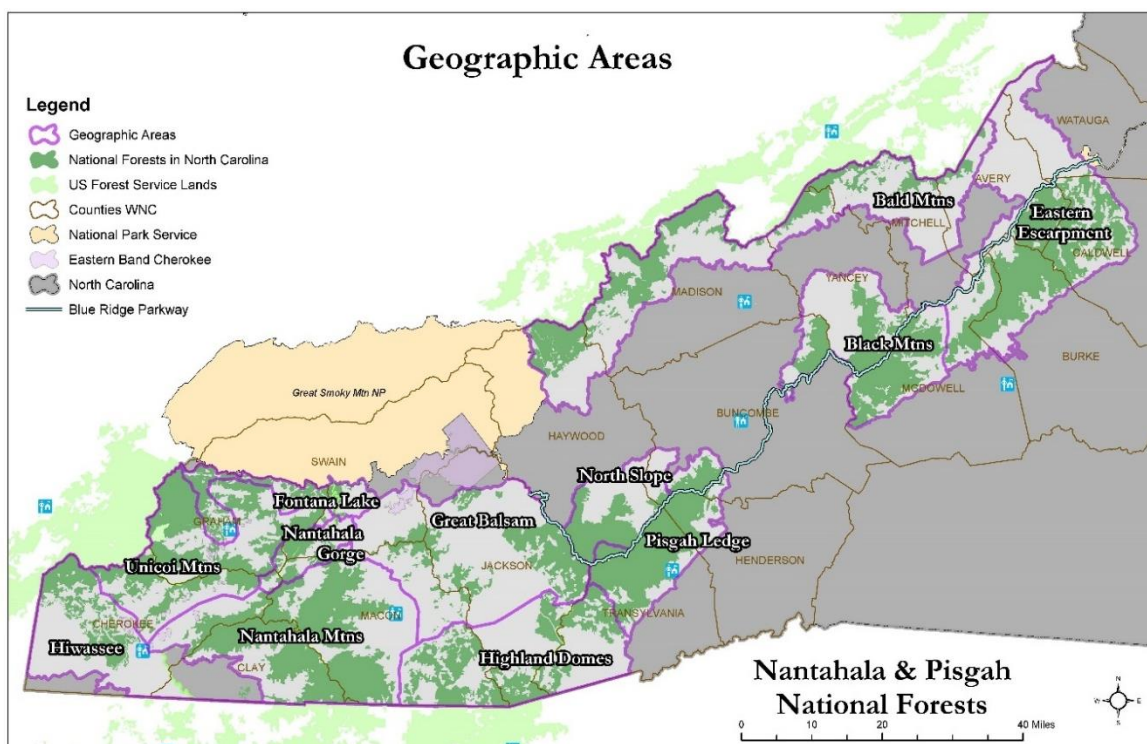


Figure 3. Geographic areas on the Nantahala and Pisgah National Forests

features, as well as forest types and vegetation composition. The lines were then further refined by consideration of cultural and historical elements, recreational opportunities and experiences, and the consideration of local communities. The Forest Service is using a diverse team of specialists, including those with local, on-the-ground knowledge, to draft an initial summary of each geographic area. In addition to Forest Service professional knowledge, we are integrating information we have heard from thousands of public comments into the development of this chapter of the plan.

While the boundaries of the geographic areas extend beyond the lands managed by the Forest Service, the larger boundaries provide context for the Forests within the broader western North Carolina landscape. The plan direction will only apply to the management of National Forest System lands.

The entire Nantahala and Pisgah National Forests and all geographic areas include ancestral lands of federally recognized Native American tribes. As is true of all the geographic areas, there are tribal community identities tied to their history and use of the land for thousands of years. Forest resources continue to be used for shelter, food, medicinal use, and ceremonial use within all geographical areas.

### **What is a geographic area goal?**

Geographic area goals are designed to be strategic to support future projects and activities without actually prescribing the precise activity that will take place. For example, goals may identify a need for more access along seasonally needed routes, prioritize non-native invasive species control measures in ecological communities, or emphasize mountain bike opportunities in a general location. Goals will not discuss specific roads, particular invasive species patches and methods of treatment, or trailheads or parking lots at a precise recreation destination. These goals help focus the forestwide objectives of the plan while still enabling future projects to make the best localized decision when the time is ripe.

Goals highlight key opportunities and values that will guide Forest Service management and reflect values the Forest Service has heard from the public. Goals for Sustaining Healthy Ecosystems considered each geographic area's departure from the Natural Range of Variation, as well as information from local employees and the public. Goals were also created to address needs identified in the Forest Plan Assessment, Need for Change, and from our analysis of current conditions. These goals are not inclusive of all activities that will occur within the geographic area and do not represent all the values that are present.

Throughout this chapter, plan components (plan decisions) are displayed with coded bullets. Text that does not contain a code does not constitute plan decisions. It is background material, explanations, or descriptions of management approaches.

## Bald Mountains Geographic Area

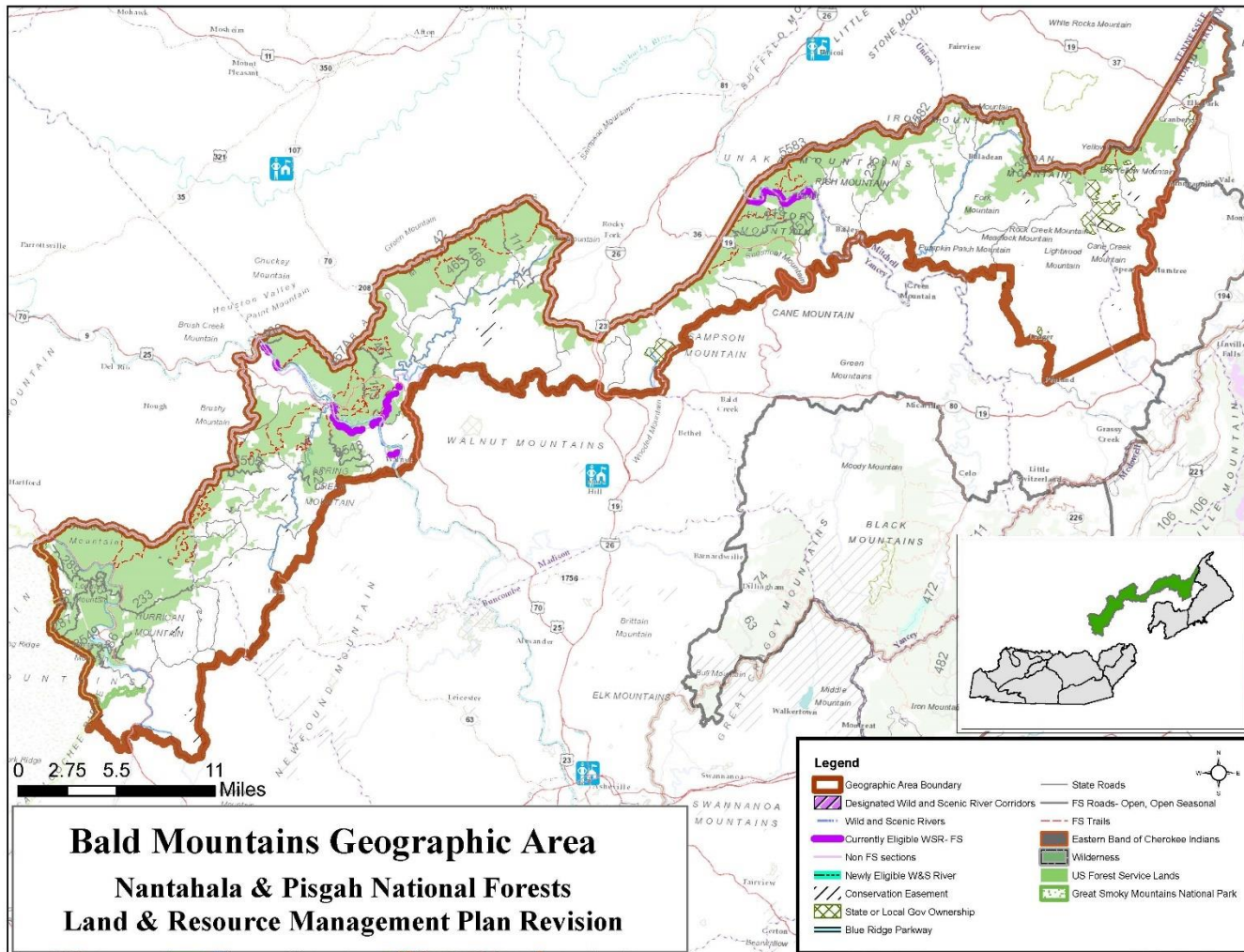


Figure 4. Bald Mountains Geographic Area

## Description of area

High elevation grassy balds add a striking diversity to the Bald Mountains Geographic Area, which is shaped by the Roan Mountain Massif, Iron Mountain Ridge, and the Unaka and Bald Mountains. The balds on these long, mostly parallel ridges are primarily treeless and provide spectacular long-range views.

The 20-mile stretch of mountain-top balds along the Roan-Unaka Mountain Range known as the Roan Highlands contains a mix of species unique on the Forests. A prominent tourist destination since the 19th century, the Roan Highlands remain one of the most visited sites in the region. One of the most distinct features of the landscape is the internationally-known Roan Mountain Rhododendron Garden occurring at over 6,000 feet.

The steep sideslopes of the undulating peaks along the state border have many drainages that feed into steep, cold streams. These streams flow to small rivers and into the Nolichucky, French Broad, Pigeon, and Elk Rivers. The Nolichucky River significantly influences the landscape, as it cuts a deep gorge separating Flattop Mountain to the south and the Unaka Mountains to the north. The region's forests include northern hardwoods and spruce-fir at higher elevations and abundant rich cove forests in the southern portion of the geographic area. Max Patch, a high-elevation opening in the Harmon Den area bisected by the Appalachian Trail, is popular with visitors.

The 118,693 acres of Forest Service-managed land in the geographic area (348,086 total acres) lie within the Appalachian Ranger District serving five counties: Mitchell, Madison, Haywood, Yancey, and Avery. The Cherokee National Forest manages lands adjacent to this geographic area in Tennessee. Local population centers, such as Hot Springs, Burnsville, Wolf Laurel, Bakersville, and Roan Mountain, rely on the lands in the geographic area for a wide range of benefits.

Management areas within the geographic area include:

- Appalachian National Scenic Trail corridor
- National Historic Trail Corridor (Overmountain Victory Trail)
- Inventoried Roadless Areas
- Big Laurel Creek scenic/botanical area, Paint Rock geological/botanical area, Big Bald Mountain geological/botanical area, and Roan Mountain botanical/zoological area
- Big Laurel Creek, French Broad River, and Nolichucky River portions of which are eligible Wild and Scenic Rivers

## Connecting people to the land

The Bald Mountains and neighboring geographic areas were the historic homeland of the Cherokee, including the Lost Cove agricultural community remnants dating from 1850s to the mid-20th century, and the Paint Rock petroglyph. Rich Mountain Lookout, built by the Civilian Conservation Corps, is a National Register of Historic Places (NRHP)-eligible historic property. The geographic area includes 14 miles of pre-contact and early historic routes, 1.5 miles of which are on the Pisgah National Forest. This area includes Paint Rock, a 5,000-year-old Native American pictograph site.

More than half of the Forest Service land in the geographic area is in a roaded-natural setting with developed recreation opportunities. Visitors to this area have a higher possibility of interacting with other visitors and Forest Service staff, especially at popular sites such as Roan Mountain, Max Patch, Elk River Falls, or Murray Branch Picnic Area. Developed boat launches and a fishing pier are popular for cold water fishing.

The geographic area's many unique recreation opportunities also attract visitors seeking solitude or adventure. Visitors enjoy long-distance hiking on the Appalachian Trail, horseback riding, mountain

biking, remote whitewater rafting/kayaking, climbing, and winter-based recreation opportunities. The lower French Broad River is one of the most visited river destinations in western North Carolina and flows through the Pisgah National Forest before entering Tennessee. The elevation drop of the Nolichucky River brings boaters to the forest for remote whitewater experiences on Class IV rapids. The Bald Mountains provide numerous opportunities to hunt white-tailed deer, black bear, small game, and upland game birds. The area also provides a unique opportunity to view elk in the area in and around Max Patch. The Roan-Unaka Mountain Range provides unique winter-based recreation opportunities such as cross-country skiing, snowshoeing, and winter camping.

Agriculture, health care, education, manufacturing, wood products, and tourism are all major economic drivers for the local communities. National Forest System lands provide a wide variety of opportunities for nature-based recreation in support of tourism; and commercial gathering of forest products such as galax, Fraser fir cones or seedlings, and medicinal herbs all contribute to the local economy.

Additionally, Walters Dam creates Waterville Lake, which provides hydropower and whitewater recreation opportunities to adjacent mountain communities.

### **Sustaining healthy ecosystems**

The unique topography, geology, and hydrology of the region sets the stage for specific restoration goals determined by the current forest composition and wildlife habitat needs. The ecological conditions in the northeast portion of this area are very different from the southern portion. The northeast portion of the area supports spruce-fir and northern hardwood ecosystems which could be enhanced to provide high quality habitat for golden-winged warblers and the endangered Carolina northern flying squirrel.

Shortleaf pine and dry-mesic oak communities surrounding Hot Springs present an opportunity to restore the forest to a more resilient composition and structure in the face of forest pressures from exotic species and changing climate. In the southern portion of the geographic area, dominated by rich cove and mesic oak forest, opportunity exists to restore young forest and oak woodlands to increase habitat for animals such as elk and ruffed grouse.

Across the geographic area overall, there is not enough young forest, and there is an overabundance of closed mid- through late-seral stages. In old growth, the high elevation red oak, dry oak, and pine ecozones are more closed than desired. This geographic area contains the highest quality grassy and alder balds in Western North Carolina and has more native vegetation than any other geographic area. These habitats are being encroached by woody vegetation. Other rare communities in the region include boulderfields and high elevation rocky summits to the north, basic and montane cliffs, and shale slope woodlands in the mid to south regions. High elevation rocky summits provide habitat for four federally listed plant species: Roan bluet, Blue Ridge goldenrod, spreading avens, and rock gnome lichen. The habitat and the associated species are under pressure from climate change.

### **Clean and abundant water**

The geographic area provides water to the municipal water supply at Cascade Branch. Approximately 1,200 miles of streams and rivers flow through the geographic area on National Forest System lands supporting numerous populations of native brook trout. The lower French Broad River supports high aquatic diversity in western North Carolina, including many rare fish, amphibians, and reptiles.

Priority watersheds in this Geographic Area include: Cold Springs Creek-Pigeon River, and Spring Creek.

### **Goals**

The following goals contribute to identification of management priorities in the Bald Mountains Geographic Area. These goals highlight key opportunities and values that will guide Forest Service

management and reflect values the Forest Service has heard from the public. These goals are not inclusive of all activities that will occur within the geographic area and do not represent all the values that are present.

### **Sustaining healthy ecosystems**

- BAM-GLS-01** Restore and maintain open conditions across mesic oak, pine-oak heath, shortleaf pine, and dry mesic oak ecozones in the Hot Springs area and where this geographic area connects to the Cherokee National Forest. Management approaches will focus on restoring appropriate distribution of age classes along with improving forest health and resiliency in the face of climate change and other pressures. In addition, reducing off-site species and improving habitat conditions for species preferring open forest conditions such as golden-winged warbler, ruffed grouse, and elk.
- BAM-GLS-02** Increase and maintain grassy balds and other open habitats at high elevations between Roan Mountain and Snowbird Mountain. Management approaches will focus on improving habitat for open area-associated species such as golden-winged warbler, Appalachian cottontail, elk, and rare plant communities.
- BAM-GLS-03** Extending west from the Harmon Den area, emphasize oak habitat and species diversity, enhancement of habitat for elk, ruffed grouse, and golden-winged warblers.
- BAM-GLS-04** Maintain and restore native populations of ginseng. Manage permitted collection of American ginseng at sustainable levels.
- BAM-GLS-05** Emphasize restoration of spruce-fir habitat for the Carolina northern flying squirrel, and maintain the health and resiliency of this forest type in the face of climate change.

### **Providing clean and abundant water**

- BAM-GLS-06** Within the Pigeon River watershed, enhance native brook trout populations by improving aquatic organism passage or population augmentation where habitat is suitable.

### **Connecting people to the land**

- BAM-GLS-07** Emphasize equestrian trail opportunities in Cold Springs, Harmon Den, and Shinbone.
- BAM-GLS-08** Respond to increased demand for access particularly in response to growing public interest in mountain biking experiences in the Hot Springs area.
- BAM-GLS-09** Emphasize visitor safety at high used recreation sites, including waterfalls such as Elk River Falls.
- BAM-GLS-10** Address supply/demand issues for equestrian and/or bicycle trail opportunities within the geographic area through collaborative trail planning to identify metrics for achieving this goal, appropriate trail mileage for each use-type, new trail locations utilizing sustainable trail design principles, potential adoption of unauthorized routes, sources of construction funding, and long-term maintenance commitments by volunteer and/or partner organizations.

### **Places to be managed in consideration of their unique features**

- BAM-GLS-11** **Roan Mountain** – Plan direction will be contained in a separate management area.
- BAM-GLS-12** **Appalachian Trail** – Plan direction will be contained in a separate management area.

- BAM-GLS-13**     **Overmountain Victory Trail** – Plan direction will be contained in a separate management area.

**Partnering with others**

- BAM-GLS-14**     Partner with Cherokee Tribes to preserve community identity and traditional and ceremonial areas and to restore high elevation balds to enhance traditional special uses. Protect and preserve Paint Rock using tribal and community partnerships.
- BAM-GLS-15**     Partner with the Cherokee National Forest on managing along the North Carolina-Tennessee state line.
- BAM-GLS-16**     Preserve Rich Mountain Fire Tower through partnerships with communities, non-government organizations, and interested members of the public.
- BAM-GLS-17**     Continue cooperation with neighboring landowners, including the North Carolina Wildlife Resources Commission, National Park Service, Eastern Band of Cherokee Indians, and Rocky Mountain Elk foundation to enhance and restore elk habitat in southwest portions of the geographic area.
- BAM-GLS-18**     Partner with trails associations and the National Park Service to preserve and interpret the Overmountain Victory Trail.



## Black Mountains Geographic Area

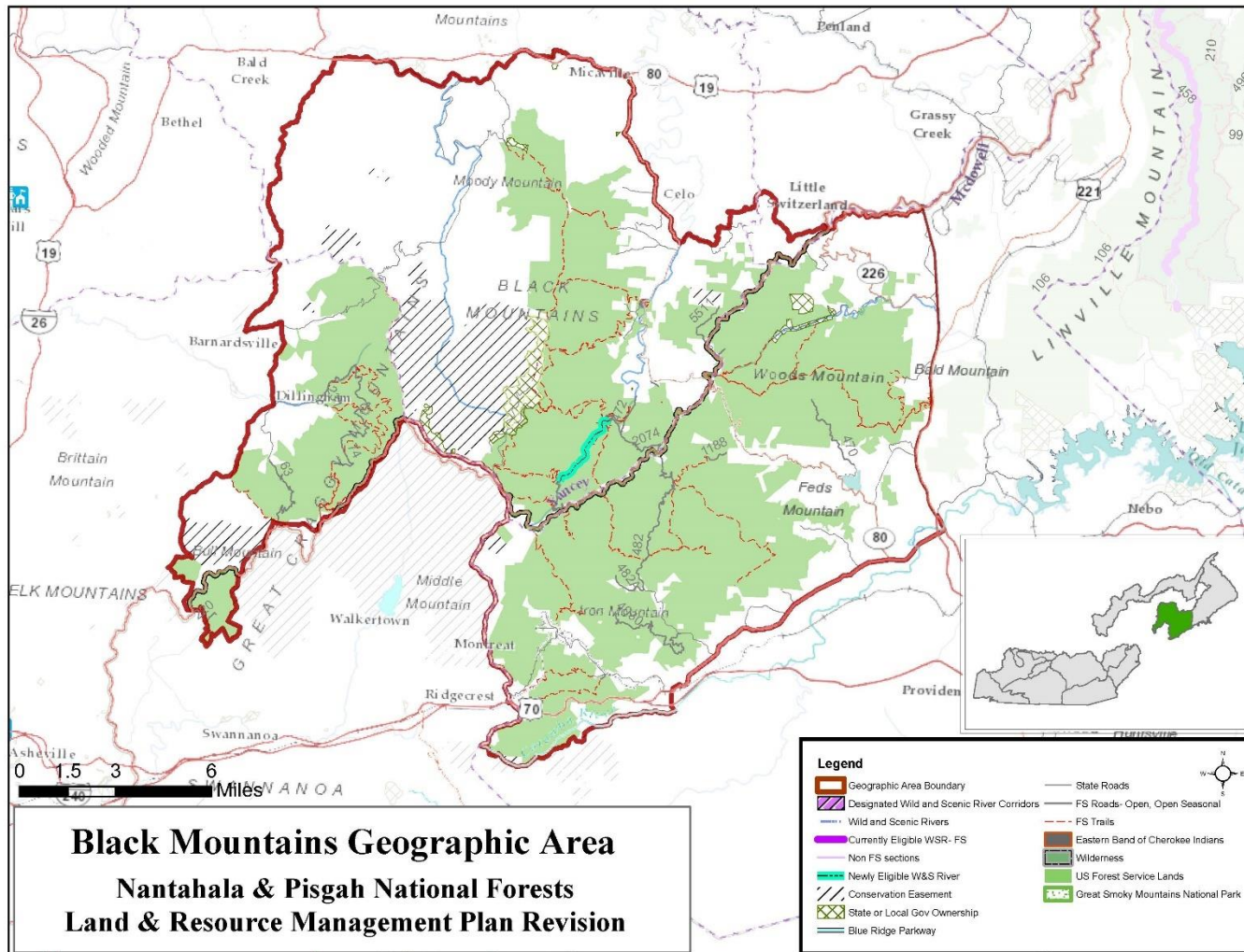


Figure 5. Black Mountains Geographic Area

## Description of area

The Black Mountains Geographic Area is dominated by the Black Mountains range and the surrounding Woods, Mackey, and Big Butt Mountains. With multiple peaks exceeding 5,000 feet in elevation, the geographic area contains the highest peaks in North Carolina, creating a dramatic setting for the communities and visitors. At the center is Mount Mitchell, the highest mountain in the eastern United States at 6,684 feet. The landscapes and ecosystems in the area are shaped by the Eastern Continental Divide and the Blue Ridge Escarpment with an abrupt change in elevation of about 3,000 vertical feet.

The forests in the geographic area are swept by heavy winds and an average of more than 70 inches of precipitation per year. This precipitation flows into narrow drainages to the North and South Toe, Cane, and Catawba Rivers. The rivers and streams create opportunities for recreation throughout the geographic area, including viewing the scenic Catawba, Roaring Fork, Walker Creek, Douglas, and Toms Creek waterfalls and some of the best trout fishing in western North Carolina. The area's precipitation and steep mountainsides also create landslides, rockfalls, debris flow, and flash flood hazards that can impact public safety, resources, and infrastructure on the forest or surrounding lands.

The Blue Ridge Parkway runs diagonally through the area from northeast to southwest and brings many visitors into the geographic area for recreation opportunities in the Appalachian Ranger District and the western portion of the Grandfather Ranger District. The Parkway runs along the Eastern Continental Divide which separates the Tennessee Valley and the Atlantic Slope. National Forest System lands within this area lie in Buncombe, Mitchell, Yancey, and McDowell counties. There are 94,421 acres of forest land in the geographic area (197,743 acres total). Communities within this geographic area include Burnsville, Spruce Pine, Marion, and Black Mountain.

Management areas within the geographic area include:

- Scenic Byway Corridors (NPS Blue Ridge Parkway)
- National Historic Trails Corridors (Overmountain Victory Trail)
- Craggy Mountain Wilderness Study Area
- Craggy Mountain scenic/botanical/zoological area, Black Mountains botanical/zoological area, North Fork Ivy Creek botanical area, and Walker Cove botanical area
- Middle Creek and Walker Cove Research Natural Areas
- Inventoried Roadless Areas
- South Toe River, portions of which are a newly eligible Wild and Scenic River

Landmarks within the geographic area outside of Forest Service Lands:

- Mt. Mitchell State Park – North Carolina's first state park and a major tourism destination and point of access to the Forest
- Blue Ridge Parkway (National Park Service)

## Connecting people to the land

Prior to European and Anglo-American intrusion and settlement, the lands in the geographic area were home to the Cherokee, Catawba, and Creek Tribes, whose traditions and culture are showcased in some of the best-preserved archeological sites in the Forests. There are no currently named Indian towns identified in this geographic area, although many large archeological sites are recorded. The area has 6.32 miles of pre-contact and early historic routes, 0.19 miles of which are on the Pisgah National Forest.

The area also contains well-preserved remnants from more recent history – the Curtis Creek Civilian Conservation Corps (CCC) Camp and the Catawba Falls hydroelectric complex. Lands in the Curtis Creek

area were the first tract acquired under the 1911 Weeks Act, setting the stage for the National Forest System in the eastern United States.

Today, community members and visitors come to the Black Mountains Geographic Area to experience two distinct settings. More than half of the area is recognized for its remote, non-motorized opportunities, giving visitors the chance to challenge themselves, experience solitude, or celebrate the therapeutic nature of the area. In this geographic area, some forest users enjoy hiking on Mountains-to-Sea Trail, Big Butt Trail, and the Black Mountain Crest Trail; horseback riding in Big Ivy and on Buncombe Horse Trail; and mountain biking on a network of trails in the Old Fort area. The limited road system provides access to this remote setting. The Black Mountains Geographic Area has a significantly lower density of open and closed roads than the other geographic areas on the Forests.

The geographic area's more easily accessible sections offer amenities and opportunities for interacting with other visitors and large groups. Developed facilities, including campgrounds and picnic sites, provide opportunities for users to experience the Forests. Water and scenic views also draw people from the Blue Ridge Parkway deeper into the Forests. Fishing is popular in several areas, including Curtis Creek and the South Toe River. Rock hounding occurs at Ray Mine, and climbing is popular at Snake Den Cliff and Corner Rock.

Roaded access and developed, well-maintained facilities within the geographic area provide hunting opportunities in areas such as Woods Mountain for game species such as white-tailed deer and wild turkey. Most of the Black Mountains Geographic Area is within a bear sanctuary. Small game (e.g., squirrels, rabbits, etc.) are also prevalent within the geographic area and support hunting opportunities. Additionally, parts of the geographic area support some of the best ruffed grouse hunting opportunities in western North Carolina.

Major economic drivers for local communities include manufacturing, timber harvest, wood products, mineral extraction, agriculture, post-secondary education, health care, and tourism. Commercial gathering of forest products such as Galax, medicinal herbs, and shrubbery provide local jobs and National Forest System lands provide a wide variety of opportunities for nature-based recreation in support of the tourism economy.

### **Sustaining healthy ecosystems**

The high elevations found in the Black Mountains support a unique ecology that provides opportunities for specific restoration goals. Peaks over 5,200 feet in the area contain spruce-fir ecosystems that are a restoration priority. In addition, the protected slopes and sheltered ravines support the tree diversity of acidic and rich cove ecosystems.

Rare communities in the geographic area include spray cliff communities around waterfalls, such as Douglas Falls, Catawba Falls, Middle Creek Falls, and Newberry Creek Falls. Large and small rock outcrops occur across the steeper portion of the geographic area. Both high elevation granitic domes and rocky summits support rare species within the Black and Craggy Mountains. Montane acidic cliffs are scattered across the entire area and provide an interface with Carolina Hemlock Bluffs. Eastern hemlock forest occurs at Briar Bottom surrounding the Black Mountain and Carolina Hemlocks Campgrounds.

Rare plant and animal species are more concentrated within the higher elevation habitats across the area, in particular the spruce-fir ecozone and its interface with northern hardwood forest. Carolina flying squirrels, spruce-fir moss spiders, mountain golden heather, and rock gnome lichens are three federally listed species occurring within these high elevation forests. Numerous SCC, including several salamanders, liverworts, and mosses, are also present.

## Clean and abundant water

Water is a prominent feature across the Black Mountain Geographic Area with approximately 900 miles of streams and rivers flowing through National Forest System lands. The geographic area provides clean and abundant water to the communities for daily use and subsistence, including several municipal drinking water supplies on National Forest System lands: Mackey Creek (Marion and Old Fort), Bowlens Creek (Burnsville), Clear Creek (Marion), and Ivy River (Weaverville). The eastern portion of the geographic area drains to the Catawba River, which provides water and power for over 1.3 million downstream users.

Priority watersheds in this geographic area include Dillingham Creek and Upper Ivy Creek.

## Goals

The following goals contribute to identification of management priorities in the Black Mountains Geographic Area. These goals highlight key opportunities and values that will guide Forest Service management and reflect values the Forest Service has heard from the public. These goals are not inclusive of all activities that will occur within the geographic area and do not represent all the values that are present.

## Sustaining healthy ecosystems

- BLM-GLS-01** Emphasize restoration of spruce-fir habitat for the Carolina northern flying squirrel, and maintain the health and resiliency of this critical forest type in the face of climate change.
- BLM-GLS-02** Emphasize restoration along Iron Mountain and areas below 2,500 ft. and mid and old woodland habitat for species requiring young and open forest conditions, such as deer, turkey, pine warblers, whip-poor-will, and several species of bat.
- BLM-GLS-03** At mid elevations accessible by existing roads, emphasize restoration of structural and compositional diversity within rich cove ecozones for species such as ruffed grouse, American woodcock, bats, and many salamander species.
- BLM-GLS-04** Emphasize restoration in unique habitats, such as at Spruce Pinnacle and locations that contain the last strongholds of native Carolina hemlocks. Prioritize Carolina hemlock treatment in this geographic area.
- BLM-GLS-05** Manage rocky areas to protect Allegheny woodrat populations from human disturbance. (See PAD-S-06).

## Connecting people to the land

- BLM-GLS-06** Direct visitors seeking opportunities for noncommercial mineral collection to the Ray Mine area.
- BLM-GLS-07** Respond to increased demand for access by a growing public interest in mountain biking and climbing, hunting, fishing, and other recreation opportunities.
- BLM-GLS-08** Emphasize the preservation and interpretation of two eligible historic districts on the National Register of Historic Places: Curtis Creek Civilian Conservation Corps Camp and Catawba Falls Historic Hydroelectric Complex. Include tribes in management and interpretation within these areas.

- BLM-GLS-09** Address supply/demand issues for equestrian and/or bicycle trail opportunities within the geographic area through collaborative trail planning to identify metrics for achieving this goal, appropriate trail mileage for each use-type, new trail locations utilizing sustainable trail design principles, potential adoption of unauthorized routes, sources of construction funding, and long-term maintenance commitments by volunteer and/or partner organizations.

### **Places to be managed in consideration of their unique features**

- BLM-GLS-10** Manage the Big Ivy area with recognition of its unique features:
- Improve watershed condition and function in priority watersheds at Dillingham Creek and Upper Ivy River on the Appalachian Ranger District from “functioning at risk” in the Watershed Condition Framework. Because of their location to each other, one watershed action plan could be developed that focuses on supporting the quality, quantity, and timing of water by focusing on:
    - i. Stream channels, large woody debris, and aquatic habitat for the benefit of aquatic biota
    - ii. Reducing sedimentation from the road and trail network to improve water quality
    - iii. Reducing terrestrial non-native invasive plants
    - iv. Improving forest health
- BLM-GLS-11** Maintain and enhance dispersed recreation opportunities and scenic integrity of Corner Rock/Big Ivy area.
- BLM-GLS-12** Emphasize access for hunting and fishing during appropriate seasons through consideration of permitting access to open and seasonally open roads for deer and bear hunting.

### **Partnering with others**

- BLM-GLS-13** Coordinate with adjacent landowners, including the National Park Service Blue Ridge Parkway, to address landslide and debris flow hazards in order to contribute to health and safety both on the forest and private lands in the area.
- BLM-GLS-14** Partner with Mount Mitchell State Park to ensure recreation linkages and high-quality conservation education opportunities.
- BLM-GLS-15** Continue strengthening partnerships with volunteer organizations to reduce deferred maintenance and increase sustainability of trail and developed and dispersed recreation infrastructure.
- BLM-GLS-16** Partner with interested tribes and non-government organizations for spruce-fir restoration.
- BLM-GLS-17** Partner with wilderness and outdoor recreation groups to assist in managing Craggy Mountain Wilderness Study Area and in educating visitors about Wilderness values and ethics and low impact camping and climbing techniques.

## Eastern Escarpment Geographic Area

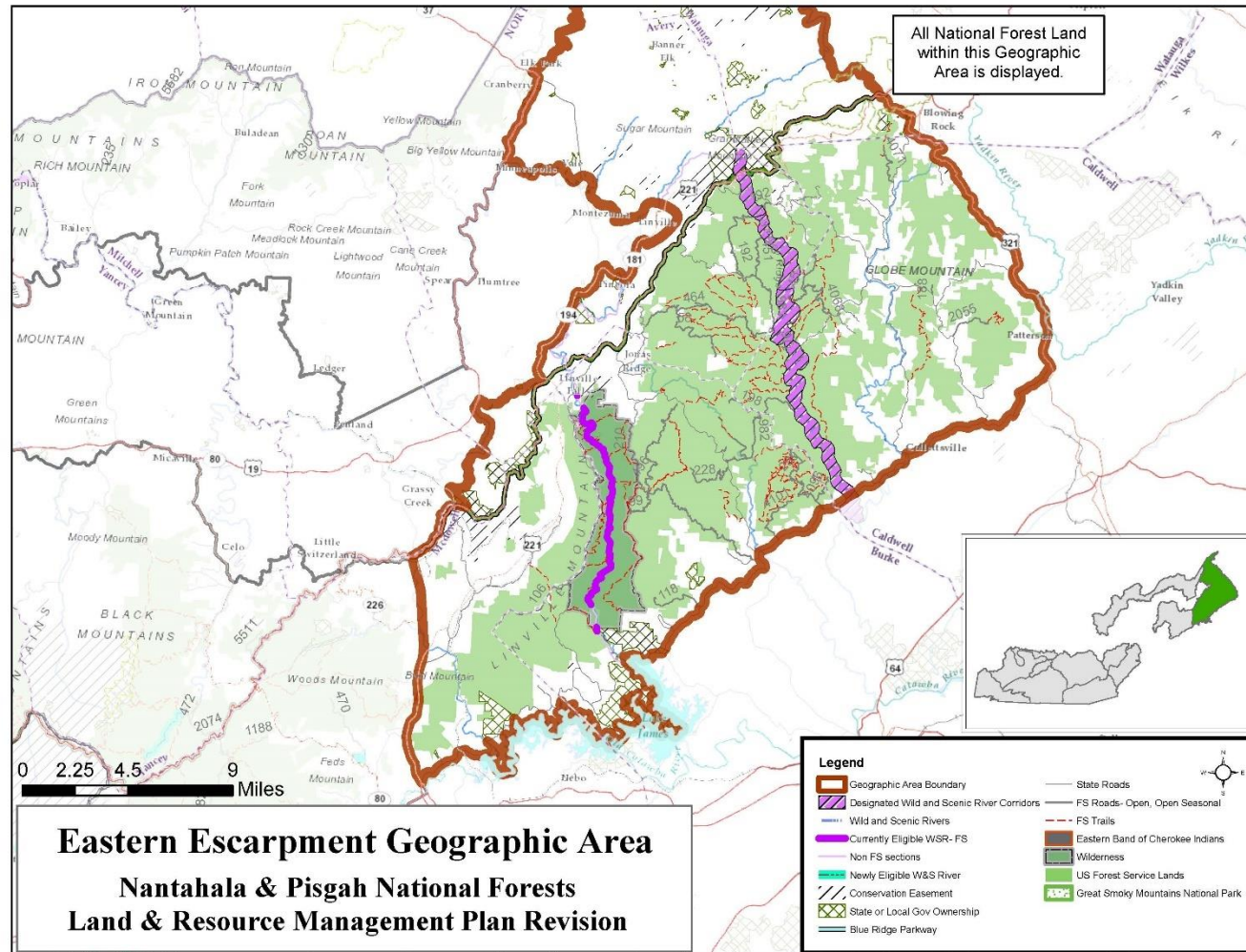


Figure 6. Eastern Escarpment Geographic Area



## Description of area

The steep and craggy landscape of the Eastern Escarpment Geographic Area is highly influenced by the Blue Ridge Escarpment, while also being shaped by Grandfather and Grandmother Mountains. The region contains distinct projecting rocks and cliffs and sudden elevation changes - the most dramatic along the perimeter of Linville Gorge. The rugged and massive rock formations along Jonas Ridge, such as Sitting Bear, Hawksbill, Table Rock, and the Chimneys, shape the forest in this geographic area. The area has experienced significant improvements in scenic visibility with reduced air pollution in the region. Air quality is likely to continue to improve toward the goal of natural background visibility by 2064.

While the ridgetops may be described as craggy and dry, rainwater drains into streams and rivers that merge to form the Johns, Catawba, and Linville Rivers, and eventually flow into Lake James. These waterbodies are highly valued for their scenic beauty, diversity of vegetation and wildlife, unique geology, and recreation opportunities. From its headwaters high on Grandfather Mountain, the Linville River carves the steep-walled Linville Gorge, dropping 2,000 feet in elevation before leveling out in the Catawba River valley at Lake James. This area has been called the “Grand Canyon of the East.” In addition, the steep slopes and abrupt elevation changes set the stage for scenic waterfalls including Linville Falls.

The Blue Ridge Parkway and Mountains-to-Sea Trail skirt the north and west boundaries of the geographic area and bring visitors to the eastern part of the Pisgah National Forest on the Grandfather Ranger District. The 139,513 acres of Forest Service land in the geographic area (347,298 acres total) fall in Avery, Burke, Caldwell, McDowell, and Watauga counties. These counties and the communities of Blowing Rock, Boone, Lenoir, Linville, and Morganton rely on the Forest for many ecosystem services that contribute to community health and wellness.

Management areas within the geographic area include:

- Scenic Byway Corridor (Blue Ridge Parkway)
- National Historic Trail Corridor (Overmountain Victory Trail)
- Linville Gorge Wilderness (a federally mandated Class I airshed area)
- Harper Creek and Lost Cove Wilderness Study Areas
- Wilson Creek, a designated Wild and Scenic River
- Linville River, an eligible Wild and Scenic River
- John’s Creek Botanical Area
- Linville Gorge Geological and Botanical Area
- Inventoried Roadless Areas

Landmarks within the geographic area outside of Forest Service Lands:

- Blue Ridge National Parkway – managed by the National Park Service

## Connecting people to the land

The Eastern Escarpment includes ancestral lands of the Catawba and Cherokee Native American tribes. In this geographic area, prominent geographical features and waterways are of particular significance to the tribes. The entire geographic area includes 18.83 miles of pre-contact and early historic routes, 1.14 miles of which are on the Pisgah National Forest.

The Eastern Escarpment is easily-accessible by car, except for the Linville Gorge and Harpers Creek/Lost Cove areas. Historical sites in the area include the Mortimer Civilian Conservation Corps Camp. Driving for pleasure and scenery viewing is often a multigenerational activity in the region with waterfall trails,

overlooks, and picnic areas bringing visitors deeper into the forest. The area has experienced significant improvements in scenic visibility with reduced air pollution in the region. Air quality is likely to continue to improve toward the goal of natural background visibility by 2064. Water-based recreation areas and campgrounds are popular for fishing and wading, and area waterfalls attract those who enjoy viewing scenery. Brown Mountain is another popular destination, including for those who come to see the famed “Brown Mountain Lights.”

Rugged backcountry areas provide unique opportunities for visitors seeking to escape from the crowds and experience a remote setting and scenery. In the region, adventure seekers enjoy the Brown Mountain off-highway vehicle trails; mountain biking along the Wilson Creek corridor; horseback riding in the Boone Fork complex; climbing in the Linville Gorge or Lost Cove Cliffs; hiking over rocky terrain on the Mountains-to-Sea Trail; backpacking in roadless settings; or backcountry fishing for trout and smallmouth bass. Wilson Creek and Harper Creek are popular with creek boaters, especially when water flows are high. Bear, deer, and turkey hunting is popular in the geographic area, especially at Forest Service Road 106, Dobson Knob, and Roses Creek. The area includes Pisgah game lands where the Forest Service coordinates with the NC Wildlife Resources Commission.

The region, in particular the Linville Mountain area, is the most lightning prone landscape within the Forests. Compared to all other geographic areas, a greater percentage of the Eastern Escarpment geographic area includes fire adapted vegetation. The urban interface areas from nearby communities surround this geographic area.

Major economic drivers for local communities include manufacturing, health care, construction, agriculture, wood products, and tourism. In addition to providing a wide variety of opportunities for nature-based recreation, National Forest System lands provide support for local economies, as it is used by many outfitters and guides, including summer camps, for multiple recreational and educational purposes. Additionally, commercial gathering of forest products such as Galax and shrubbery contributes to local economies.

### **Sustaining healthy ecosystems**

This geographic area supports the largest expanse of shortleaf pine and pine-oak heath habitats of all of the geographic areas, providing for specific opportunities. Shortleaf pine is a high priority restoration effort across many of the southeast states, and goals can be met by restoring young forest and developing woodland communities in the geographic area. Pine-oak heath habitats will be restored using prescribed fire. Thinning the dominant dry-mesic oak habitats will create open forest and woodland conditions and restore wildlife habitat.

The Eastern Escarpment supports unique ecozones, which provide habitat for rare plant and animal species. Rare vegetation and ecosystems include Carolina hemlock forest, low elevation rocky summits, upland pools, as well as rocky bar and shore communities. The Eastern Escarpment has higher quality Carolina hemlock forests than any other geographic area. It is critical to maintain this rare community, which is currently impacted by hemlock wooly adelgid, within this geographic area to maintain its persistence across the Nantahala and Pisgah National Forests as well as throughout its limited range. Linville Gorge Wilderness provides 80 percent of the entire range-wide occupied habitat for mountain golden heather, a federally listed plant.

### **Clean and abundant water**

The geographic area supplies waters to nearby municipalities from sources including Upper, Steels, Roses, and Irish Creeks.



Approximately 1,000 miles of streams and rivers run through the geographic area on National Forest System lands. This geographic area supports the western-most population of the brook floater, a rare native freshwater mussel, in North Carolina.

Priority watersheds in this Geographic Area include: Upper and Lower Wilson Creek; Upper, Middle and Lower Johns River; and Lake James-Catawba River.

## Goals

The following goals contribute to identification of management priorities in the Eastern Escarpment Geographic Area. These goals highlight key opportunities and values that will guide Forest Service management and reflect values the Forest Service has heard from the public. These goals are not inclusive of all activities that will occur within the geographic area and do not represent all the values that are present.

### Sustaining healthy ecosystems

- EE-GLS-01** Restore and maintain open and woodland forest conditions utilizing a range of management approaches with focus on restoring appropriate fire frequency within pine-oak heath, shortleaf pine, dry oak, and dry-mesic oak ecozones. Emphasize restoration in fire-adapted ecological communities to reduce off-site or non-native species, improve wildlife habitat and species diversity, and facilitate hunting opportunities for game species such as white-tailed deer, bear, and ruffed grouse.
- EE-GLS-02** Maintain scattered islands of Carolina hemlock forests within geographic area with emphasis at Dobson Knob and in Linville Gorge. Prioritize Carolina hemlock treatment in this geographic area.
- EE-GLS-03** Continue to support conservation and protection of peregrine falcons through monitoring, seasonal closure of select rock faces, and collaboration with the climbing and recreation community.
- EE-GLS-04** Maintain and restore mountain golden heather habitat using prescribed burning and wildfire objectives where appropriate.

### Providing clean and abundance water

- EE-GLS-05** Improve watershed conditions across geographic area. Focus restoration efforts in the Johns River watershed and to mitigate effects in the existing off-highway vehicle use area.
- EE-GLS-06** Continue to expand the known, occupied range of the brook floater within the geographic area through increased inventory, population augmentation, and species reintroductions.

### Connecting people to the land

- EE-GLS-07** Respond to increasing demands for sustainable mountain biking and horseback riding opportunities in the northern and eastern parts of the geographic area, as well as access to popular climbing areas where those opportunities exist.
- EE-GLS-08** Preserve, protect, and restore locations that have significant connections to Catawba history and identity. Partner with the tribe to develop and implement cultural/historical interpretation at appropriate locations.

- EE-GLS-09** Address supply/demand issues for equestrian and/or bicycle trail opportunities within the geographic area through collaborative trail planning to identify metrics for achieving this goal, appropriate trail mileage for each use-type, new trail locations utilizing sustainable trail design principles, potential adoption of unauthorized routes, sources of construction funding, and long-term maintenance commitments by volunteer and/or partner organizations.

### **Places to be managed in consideration of their unique features**

- EE-GLS-10** Wilson Creek: Continue working with partners to maintain a quality recreation experience, reduce erosion and sedimentation, restore aquatic organism passage, improve fisheries, and reduce non-native invasive species.
- EE-GLS-11** Linville Gorge:
- i. Maintain scattered islands of Carolina hemlock forests within geographic area with emphasis in Linville Gorge.
  - ii. Anticipate increased visitation to Linville Gorge Wilderness. Emphasize management actions that sustain, restore, or enhance high quality wilderness recreation experiences, including naturalness and opportunities for solitude.
  - iii. Emphasize treatment of non-native invasive species in and around Linville Gorge Wilderness.
  - iv. Reduce or eliminate impacts to T&E species such as Heller's Blazing Star and mountain golden heather at Linville Gorge.
  - v. Partner with nearby communities in an integrated response to managing fire in and around urban interface areas.

### **Partnering with others**

- EE-GLS-12** Partner with nearby communities in an integrated response to managing fire in and around urban interface areas.
- EE-GLS-13** Partner with wilderness and outdoor recreation groups to assist in managing Linville Gorge Wilderness and the geographic area's Wilderness Study Areas and in educating visitors about Wilderness ethics and low impact camping and climbing techniques.
- EE-GLS-14** Partner with diverse recreation groups to assist in maintaining and enhancing the quality of recreation opportunities including collaborative efforts to increase multi-use trails.
- EE-GLS-15** Work with recreation groups to maintain the integrity and resiliency of rare plant communities through site specific management, stewardship, and education.

## Pisgah Ledge Geographic Area

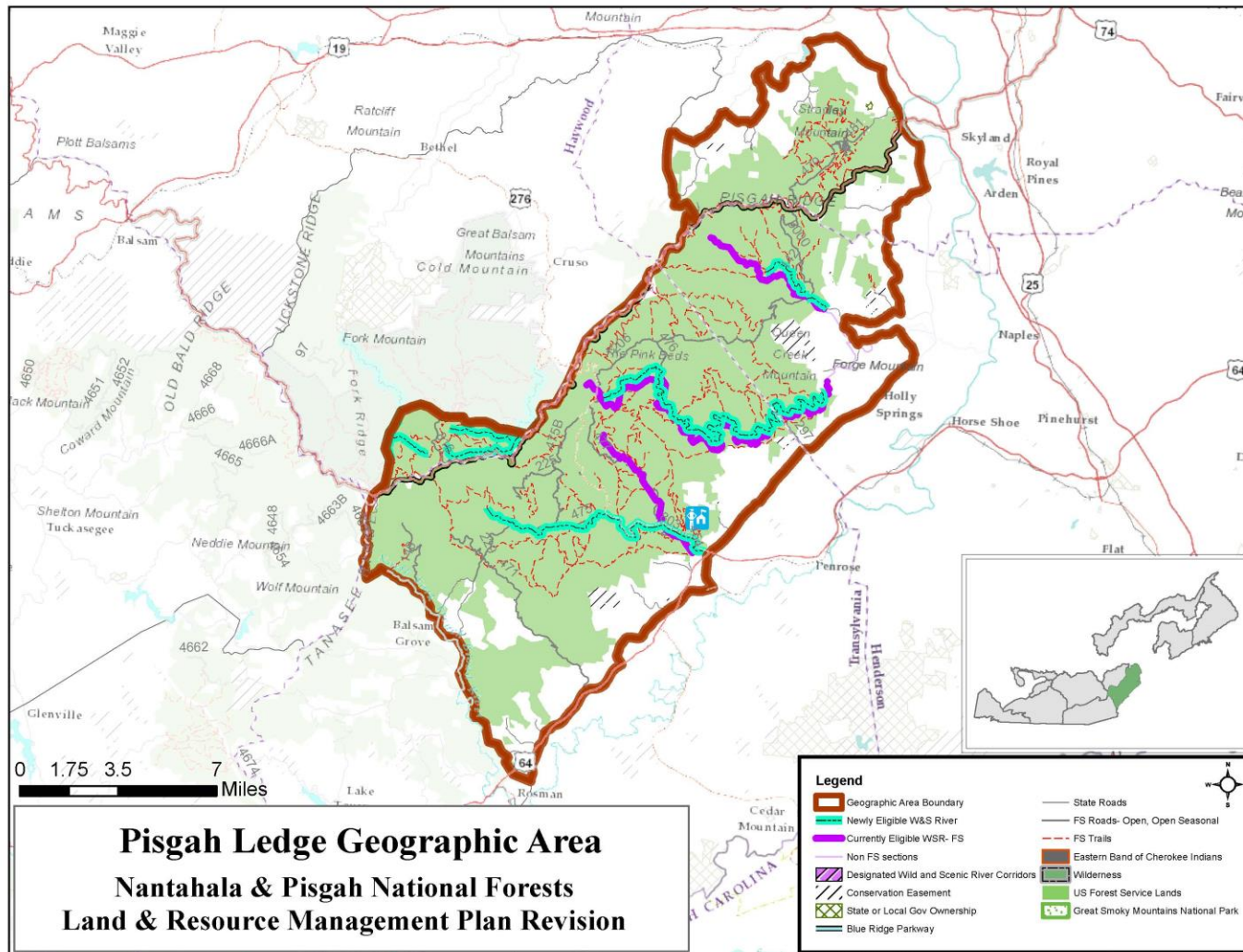


Figure 7. Pisgah Ledge Geographic Area

## Description of area

The Pisgah Ledge Geographic Area is on the northern end of the granitic dome landscape and is characterized by bare, rolling rock faces including Cedar Rock, Pilot Mountain, John's Rock, and Looking Glass Rock. The landscape, full of unique geology and beautiful waterfalls, is bordered by western North Carolina's densest urban areas, making the Pisgah Ledge the most well-known and visited area in North Carolina's National Forests. This area has the highest levels of visitation on the Nantahala and Pisgah National Forests and the highest concentration of developed and dispersed recreation sites.

The region is defined by mountain peaks and cliff faces that give way to narrow valleys with striking rivers and waterfalls. Graveyard Fields, Black Balsam, and Devil's Courthouse are popular high elevation areas for visitors seeking access to the region's natural beauty. Waterfalls provide unique sightseeing opportunities, and the rivers provide water-based recreation opportunities, including swimming and tubing in areas such as Sliding Rock and the Davidson River Corridor.

The Pisgah Ledge Geographic Area includes some of the most widely known areas and locations connected to Cherokee Tribal community identity: beliefs, traditions, and uses. The Judaculla landscape, which figures most prominently in Cherokee tradition, is within this geographic area.

The Blue Ridge Parkway and Forest Heritage Scenic Byway bring locals and visitors from around the world to and through the 100,644 acres (out of 141,824 total acres) of Forest Service land that lie within the Pisgah Ledge and include portions of Transylvania, Henderson, Buncombe, and Haywood counties. The Mountains-to-Sea Trail traverses the northern boundary of this geographic area, adjacent to the Blue Ridge Parkway.

Local population centers, which include Brevard, Mills River, Hendersonville, Waynesville, and Asheville, rely on the lands within the geographic area for a variety of benefits centered on water and recreation.

Management areas within the geographic area include:

- The Cradle of Forestry in America Historic Site
- Scenic Byway Corridors (Blue Ridge Parkway and Forest Heritage National Scenic Byway)
- Bent Creek Experimental Forest
- John Rock scenic area, Looking Glass Rock scenic/geological/botanical area, and Pink Bed Bogs botanical area
- Davidson River, East Fork Pigeon River, Dark Prong, Yellowstone Prong, and Mills River System (North and South Mills River), portions of which are eligible Wild and Scenic Rivers; Flat Laurel Creek, West Fork Pigeon River, and North Fork French Broad River, portions of which are newly eligible Wild and Scenic Rivers
- Inventoried Roadless Areas

Landmarks within the geographic area that are not managed by the Forest Service include:

- Pisgah Inn (on the Blue Ridge Parkway)
- Blue Ridge Parkway (National Park Service)

## Connecting people to the land

Prior to European and Anglo-American intrusions and settlement along with westward expansion, the Pisgah Ledge was home to the Cherokee, Catawba, and Creek Tribes. This area contains several locations that are most prominent in tribal history and have significant meaning to tribal identities and beliefs. Drainages and balds in all directions around "Devil's Courthouse" (a non-Indian misnomer) are the center of Cherokee tradition. The Cherokee town of Kana'sta is identified within this geographic area.

Additionally, the geographic area contains 0.50 mile of pre-contact and early historic routes, 0.10 mile of which is on the Pisgah National Forest.

The Pisgah National Forest is considered the birthplace of modern scientific forestry in North America. The geographic area was heavily logged and used as farmland by the early American settlers in the 19th century. In the late 1880s, George Vanderbilt began acquiring land in the geographic area to be used as the center of a working estate. He hired prominent landscape architect Frederick Law Olmstead Sr. and Gifford Pinchot, who went on to become the first chief of what became the Forest Service, an agency of the U.S. Department of Agriculture, to advise him on how to manage the property. Olmstead recommended turning the lands into a working forest managed under scientific principles common in European forestry but little used in the United States. Pinchot's successor, Carl Schenk, established the Biltmore Forest School, the first school of forestry in the United States, in 1898.

George Vanderbilt's widow, Edith Vanderbilt, sold a large land tract, over 86,000 acres, to the Federal government in 1914 to "maintain in the fullest and most permanent way its national value as an object lesson in forestry." With the acquisition of the Biltmore lands, the Federal government established the Pisgah National Forest and Pisgah National Game Preserve in 1916. The site of the historic school is now part of the 6,540-acre Cradle of Forestry in America Historic Site in this geographic area, which provides visitors with a glimpse of this history through its museum, events, and exhibits.

Bent Creek Experimental Forest, the oldest federal experimental forest east of the Mississippi River, is within this geographic area. Bent Creek emphasizes silvicultural practices that aid in the rehabilitation of cut-over lands and promote sustainable forestry. Current research goals also focus on understanding and predicting how upland hardwood-dominated forests and wildlife communities are affected by natural disturbances and shaped by silvicultural activities. It is also a popular recreation destination for mountain bikers and hikers largely due to its proximity to the Asheville area.

This geographic area is home to some of the most visited recreation sites in the region. The Blue Ridge Parkway crosses the geographic area for 28 miles, and National Forest System lands provide visitors with the scenic backdrop. There is easy access to hiking on trails such as the Art Loeb National Recreation Trail, as well as numerous horseback riding, climbing, and camping opportunities. Pisgah Ledge is also one of the premiere destinations for mountain bikers from many areas of the country and hosts several major races. Additionally, berry picking is a popular activity in the forest.

The high level of visitation from across the country, as well as the close proximity to major population centers in North Carolina, Georgia, and South Carolina, create a large demand for recreational opportunities, and, along with it, come major challenges in managing visitor impacts.

In addition to this area's popularity among a diversity of recreationists, there is a dedicated contingent of sportsmen that continue the hunting and fishing heritage, notably for white-tailed deer, wild turkey, black bear, and ruffed grouse. The area also supports important habitat for the Appalachian Cottontail and is a popular fishing destination, especially for anglers seeking to fish its cold water trout streams.

Major economic drivers for local communities include tourism, manufacturing, health care, and education. The area is home to several colleges and universities, including University of North Carolina-Asheville, Brevard College, Warren Wilson College, and Montreat College. This geographic area also includes the North Carolina Arboretum, as well as the Bobby N. Setzer Fish Hatchery and Pisgah Center for Wildlife Education which operate under long-term special use authorizations on National Forest lands. National Forest System lands are considered a major tourism asset for local communities and commercial gathering of forest products such as Galax contribute to local economies.

## Sustaining healthy ecosystems

The Pisgah Ledge Geographic Area marks the northeast extent of the state's granitic dome range. Acidic cove, rich cove, mesic oak, spruce fir, and dry-mesic oak forests predominate in the geographic area, with high elevation red oak and northern hardwood forests frequently found at higher elevations.

Habitat restoration in the geographic area will focus on increasing biodiversity and in particular on retaining a vigorous oak component. The area includes bear sanctuaries and vertical rock faces such as Cedar Rock, Looking Glass Rock, and Victory Wall that provide critical nesting habitat for the peregrine falcon. This geographic area is home to the only existing population of the federally threatened small whorled pogonia in the Nantahala and Pisgah National Forests.

Rare communities in the geographic area include high elevation rock outcrops, montane cliffs, bogs and seeps, waterfall spray cliffs, and rocky bar and shore habitats.

## Clean and abundant water

The Pisgah Ledge Geographic Area features a large number of streams and rivers that provide recreation and scenic beauty for residents and visitors, with approximately 1,200 miles of streams and rivers flowing through National Forest System lands. Additionally, Catheys Creek provides water to the town of Brevard; and the North Fork Mills River and Bradley Creek are municipal water sources for the city of Hendersonville.

Pisgah Ledge is one of the most popular destinations in North Carolina for trout fishing. Major trout fishing destinations include North and South Mills River, Yellowstone Prong, East and West Fork Pigeon River, and Davidson River and provide a major benefit to local economies via tourism and income for outfitters and guides.

Priority watersheds in this Geographic Area include: Bent Creek-French Broad River, South Fork Mills River, Mills River, Catheys Creek, North Fork French Broad River.

## Goals

The following goals contribute to identification of management priorities in the Pisgah Ledge Geographic Area. These goals highlight key opportunities and values that will guide Forest Service management and reflect values the Forest Service has heard from the public. These goals are not inclusive of all activities that will occur within the geographic area and do not represent all the values that are present.

## Sustaining healthy ecosystems

- PL-GLS-01** Management activities will focus on sustaining oak species across a range of age classes, contributing to the Natural Range of Variation, forest health, game, and non-game species habitat as well as watershed condition.
- PL-GLS-02** Reduce the abundance of white pine in the North Mills River and Davidson River watersheds while enhancing oak regeneration and hunting opportunities.
- PL-GLS-03** Continue to support conservation and protection of peregrine falcons through monitoring, seasonal closure of select rock faces, and collaboration with the climbing and recreation community.
- PL-GLS-04** Enhance structural diversity within the dry-mesic oak forest surrounding small whorled pogonia.
- PL-GLS-05** Expand spruce restoration in the Flat Laurel Creek and Graveyard Fields Areas.

- PL-GLS-06** Enhance structural conditions for ruffed grouse, deer, and turkey by providing more young forest.

### **Providing clean and abundant water**

- PL-GLS-07** Sustain and improve aquatic habitat to benefit vertebrate and invertebrate species in Davidson and Mills River drainages as well as headwaters of French Broad. Management actions will focus on key species, including native brook trout and hellbenders.
- PL-GLS-08** Protect seeps and waterfalls at Courthouse Creek.
- PL-GLS-09** Provide high quality water sources for municipal watersheds within the geographic area. Management actions will focus on reducing sedimentation and other negative impacts to water quality while and sustaining forest health.
- PL-GLS-10** Continue to improve trail conditions at Graveyard Fields, Black Balsam, and Sam Knob areas to accommodate high visitation and mitigate erosive impacts to fragile soils.

### **Connecting people to the land**

- PL-GLS-11** With increased visitation along the Forest Heritage National Scenic Byway corridor (U.S. 276), emphasize management actions that sustain and enhance high quality recreation experiences with a focus on visitor safety, improving access, and reducing impacts to natural resources.
- PL-GLS-12** Utilizing visitor education and collaboration with multiple user groups, improve interactions between users to enhance visitor experience and safety.
- PL-GLS-13** Utilize the Cradle of Forestry to demonstrate both historical and contemporary forestry practices.
- PL-GLS-14** Continue to support scientific forestry research at Bent Creek Experimental Forest and manage the area to support this function.

### **Partnering with others**

- PL-GLS-15** Improve coordination with local governments, volunteer organizations, and non-governmental organizations to leverage the high level of public interest and support in this geographic area. Management actions will focus volunteer and partner efforts to meet critical needs.
- PL-GLS-16** Work with recreation groups to maintain the integrity and resiliency of rare plant communities and species through site specific management, stewardship, and education.
- PL-GLS-17** Consult and partner with Cherokee Tribes to identify and ensure preservation and protection of special tribal areas and to develop interpretation as appropriate. Include the National Park Service's Blue Ridge Parkway in the latter.



## North Slope Geographic Area

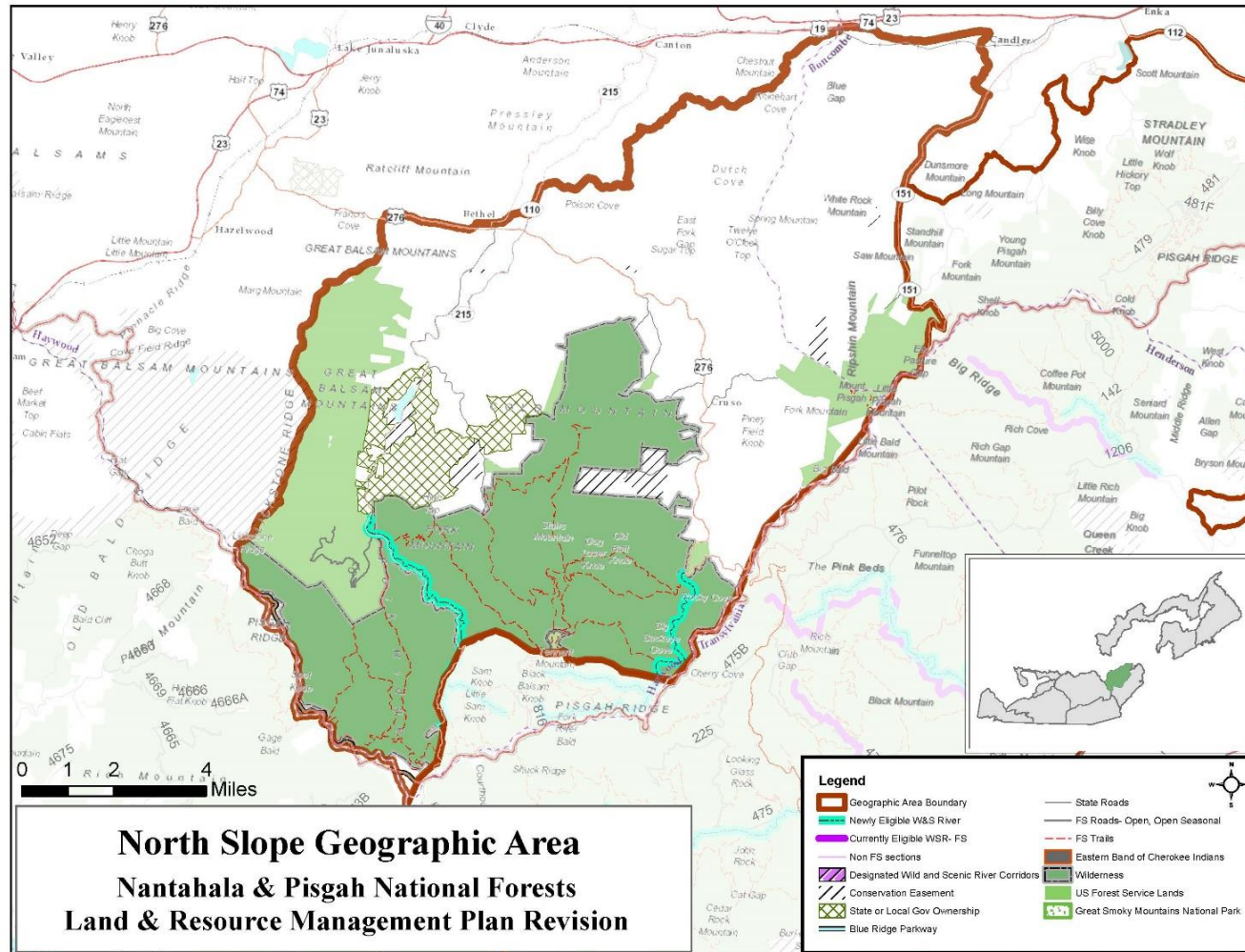


Figure 8. North Slope Geographic Area



## Description of area

The North Slope Geographic Area is characterized by remote landscapes and high elevation mountains (3,000 – 6,000 feet), including Mt. Pisgah, Richland Balsam, Mt. Hardy, and Cold Mountain.

Numerous swift-moving streams work their way down the rugged slopes to the Little East Fork and the East and West Forks of the Pigeon Rivers. Countless waterfalls decorate the landscape and tiny branches of streams rise more than 5,000 feet above sea level. These cold mountain streams provide high-quality backcountry fishing opportunities, including the native brook trout. The area has experienced significant improvements in scenic visibility with reduced air pollution in the region. Air quality is likely to continue to improve toward the goal of natural background visibility by 2064.

The Blue Ridge Parkway and Forest Heritage Scenic Byway surround the remote areas of the region and bring many visitors to enjoy the diverse forests and landscapes. This geographic area is entirely within the Pisgah Ranger District. Communities within the area include Canton, Candler, and Waynesville. These communities and residents of Haywood and Buncombe counties rely on the 37,913 acres of National Forest System lands in this geographic area (90,551 total acres) for many ecosystem services, such as clean water and recreation.

Management areas inside the North Slope Geographic Area include:

- Scenic Byway Corridors (Blue Ridge Parkway and Forest Heritage National Scenic Byway)
- Shining Rock (a federally mandated Class I area) and Middle Prong Wilderness Areas
- Inventoried Roadless Area
- Fork Ridge-Mount Hardy and Mount Pisgah botanical areas
- East Fork Pigeon River, portions of which are an eligible Wild and Scenic River; and West Fork Pigeon River, portions of which are a newly eligible Wild and Scenic River

Landmarks within the geographic area that are not managed by the Forest Service include:

- Blue Ridge National Parkway (National Park Service)

## Connecting people to the land

The North Slope Geographic Area was historically a center for logging in North Carolina. When Carl Schenck's Biltmore School of Forestry was forced to vacate its premises on the Vanderbilt's Biltmore Estate near Asheville in 1910, it briefly relocated to the village of Sunburst, a logging community in this geographic area. The Sunburst site is now a developed camping area maintained by the Forest Service.

Almost two-thirds of the North Slope Geographic Area are in congressionally designated Wilderness and Inventoried Roadless Areas, providing remote settings, challenge, and reliance on primitive skills and opportunities for solitude. The area provides many miles of hiking trails for day-hiking and backpacking, as well as some opportunities for horseback riding. Although much of the area is managed to provide opportunities for solitude, Shining Rock Wilderness experiences high levels of visitation. Other popular activities include backcountry fishing in the headwaters of the Pigeon River and tributaries. Deer, turkey, grouse, and bear hunting occurs across the geographic area but is popular in areas such as Lickstone Ridge and Cold Mountain.

The largely undeveloped backdrop of the geographic area surrounds the Forest Heritage Scenic Byway (U.S. 276 and N.C. 215) and the Blue Ridge Parkway, both of which provide access to these remote areas. These scenic routes also bring visitors to the forest for sightseeing and camping opportunities. The area has experienced significant improvements in scenic visibility with reduced air pollution in the region. Air quality is likely to continue to improve toward the goal of natural background visibility by 2064. Tourism, health care, and manufacturing are all major economic drivers for the local communities.

National Forest System lands provide a wide variety of opportunities for nature-based recreation in support of tourism and the local economy.

### **Sustaining healthy ecosystems**

The topography of North Slope supports a unique mix of forest habitats, which provides opportunity for specific restoration and wildlife goals. Due to high elevation peaks, the region hosts a high concentration of spruce fir ecosystems, which provide an opportunity to maintain and enhance this forest type through creating small gaps and planting red spruce. The high elevations are also home to red oak and northern hardwood forests. These forests, along with rich cove and mesic oak forests in mid elevation areas, provide opportunities for hardwood forest restoration. Specifically, opportunities exist to increase diversity in the rich cove and mesic oak forest in the Sunburst area.

Rare habitats in the area such as heath balds, Carolina hemlock forests, beech gaps, boulderfields, and cranberry bogs provide a home for rare plants and animals. Federally endangered rock gnome lichen is abundant in the upper headwaters and surrounding forests of Flat Laurel Creek.

### **Clean and abundant water**

The Pigeon River provides an industrial water source to the paper manufacturing industry in Canton. Approximately 140 miles of creeks and rivers run through the geographic area on National Forest System lands.

Priority watersheds in this Geographic Area include: South Fork Mills River, Wolf-Creek-Tuckasegee River, Davidson River, North Fork French Broad River, and Caney Fork.

### **Goals**

The following goals contribute to identification of management priorities in the North Slope Geographic Area. These goals highlight key opportunities and values that will guide Forest Service management and reflect values the Forest Service has heard from the public. These goals are not inclusive of all activities that will occur within the geographic area and do not represent all the values that are present.

### **Sustaining healthy ecosystems**

- NS-GLS-01** Restore diverse forest structure and age classes in areas outside of designated wilderness areas to improve forest resilience and to ensure connectivity of a range of suitable wildlife habitat over the long term across the geographic area.
- NS-GLS-02** Restore and maintain select high elevation openings to increase needed wildlife habitat for Appalachian cottontail, elk, and ruffed grouse.
- NS-GLS-03** Emphasize restoration of spruce-fir and northern hardwood forests for the Carolina northern flying squirrel and rock gnome lichen, and maintain health and resiliency of these critical forest types in the face of climate change.

### **Connecting people to the land**

- NS-GLS-04** Evaluate how to best protect wilderness values, mitigate impacts from high visitation, and implement appropriate actions to maintain Wilderness character for solitude, naturalness, and primitive and unconfined recreation.
- NS-GLS-05** Improving game and non-game wildlife habitat in the Lickstone Ridge area for hunting and wildlife viewing.

### **Providing clean and abundant water**

- NS-GLS-06** Maintain or expand the range of native brook trout in the headwaters of the Pigeon River through population augmentation, reintroduction, or reconnecting fragmented populations through improved aquatic organism passage at road and trail stream crossings.
- NS-GLS-07** Restore and/or maintain healthy populations of hellbenders in East Fork and West Fork Pigeon River.

### **Partnering with others**

- NS-GLS-08** Partner with organizations and volunteers to support and enhance Wilderness values and experiences.
- NS-GLS-09** Work with local governments and other organizations to improve signage and information for all Wilderness visitors.
- NS-GLS-10** Partner with wilderness and outdoor recreation groups to assist in managing Shining Rock and Middle Prong Wilderness and in educating visitors about wilderness values and ethics including low impact camping and climbing techniques.

## Highland Domes Geographic Area

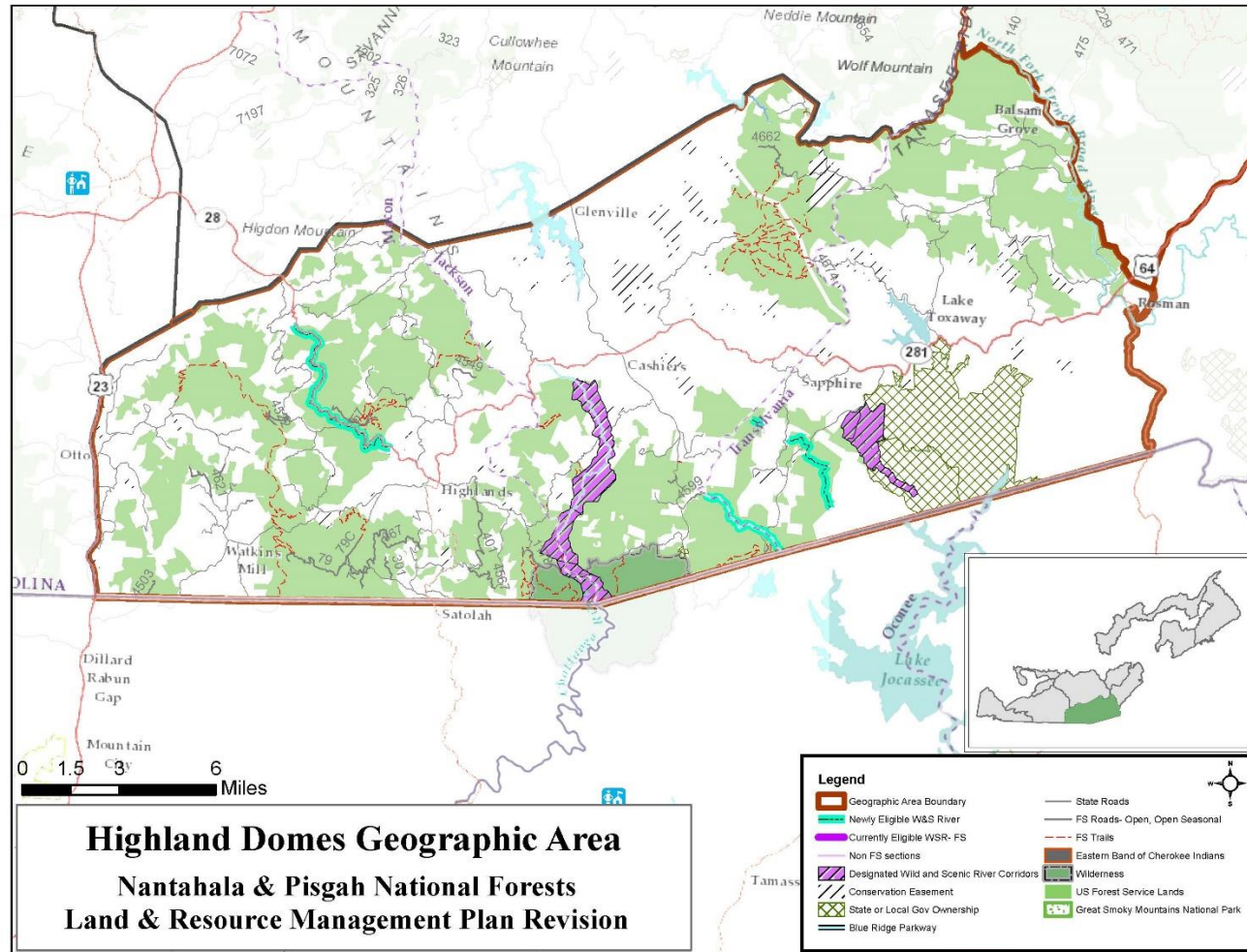


Figure 9. Highland Domes Geographic Area

## Description of area

“The land of granite walls and waterfalls,” the Highland Domes Geographic Area contains a varied landscape of broad valleys, wild rivers, cliffs, and high granitic domes many hundreds of feet tall. The region’s geography encompasses peaks such as Yellow Mountain, Terrapin Mountain, Blackrock Mountain, Fodderstock Mountain, and Whiteside Mountain providing large, expansive views and the Panthertown Valley, a landscape unique to the eastern United States.

The waters of the Highland Domes drain through dramatic rock formations and changes in elevation with the area’s streams draining into major rivers including the Horsepasture, Chattooga, Tuckasegee, Thompson, Cullasaja, and Whitewater. The Chattooga and Cullasaja Rivers are deep gorges as they drain out of the geographic area. The area’s many waterfalls, which include the highest waterfall east of the Mississippi River, Whitewater Falls, are some of western North Carolina’s most popular attractions. Bogs and streams offer unique habitat for wildlife; trout streams bring many anglers to the area.

This area contains several landscape features that figure most prominently in Cherokee Tribal history and have significant meaning to tribal identities and beliefs, including the Judaculla landscape. These locations serve as some of the most important traditional and ceremonial areas of the Cherokee.

The 94,353 acres of National Forest System land (244,897 total acres within the area) lie in the Nantahala and Pisgah Ranger Districts within the borders of Transylvania, Macon, and Jackson counties. Local population centers include Highlands, Cashiers, Sapphire, and Rosman.

Management areas within the geographic area include:

- Ellicott Rock Wilderness Area and Overflow Creek Wilderness Study Area
- Whitewater Falls National Scenic Trail
- Bartram National Recreation Trail
- Blue Valley Experimental Forest
- Inventoried Roadless Areas
- Cullasaja Gorge botanical/geological area, Ellicott Rock – Chattooga River botanical/zoological area, Bonas Defeat Gorge geological/scenic area, Cole Mountain-Shortoff Mountain botanical area, Kelsey Track botanical/zoological area, Piney Knob Fork botanical area, Scaly Mountain and Catstairs botanical area, Slick Rock botanical area, Walking Fern Cove botanical area, Whiteside Mountain geological/scenic/botanical area, Whitewater Falls scenic/botanical area, and Dismal Falls botanical/scenic area
- Chattooga River and Horsepasture River, portions of which are designated Wild and Scenic Rivers; Cullasaja River, Thompson River, and Whitewater River, portions of which are newly eligible Wild and Scenic Rivers

Landmarks within the geographic area that are not managed by the Forest Service include:

- Gorges State Park
- Toxaway Gamelands
- Laurel Knob Cliff and Climbing Area

## Connecting people to the land

Prior to European and American intrusion and settlement, the lands in the Highland Domes were home to the Cherokee and Creek Tribes. The region contains historical sites such as the 1949 Highlands Recreation Area and Civilian Conservation Corps constructed sites. The geographic area includes the

three Cherokee towns of Tillino Old Town, Coweeta, and Tessentee. This area contains 88.78 miles of pre-contact and early historic routes, 22.73 miles of which are on the Nantahala and Pisgah National Forests.

The steep forested mountains, coves, and soaring granite cliffs provide outstanding opportunities for hiking, horseback riding, mountain biking, and climbing. Almost two-thirds of the geographic area is easily accessible by roads, giving visitors a chance to experience the forest in a developed and less challenging setting. Several scenic waterfalls are visible from the roadside. The area features several developed areas and campgrounds that provide opportunities to camp, picnic, fish, and view waterfalls and scenic areas. There are popular hiking trails near open roads such as the Cliffside Interpretive Trail. Hunters and sportsmen can access the forest for ruffed grouse, white tailed deer, turkey, and black bear. The region's rivers provide visitors with access to fishing, with anglers seeking brook trout especially attracted to the headwaters of the Cullasaja, Tuckasegee, and Whitewater Rivers.

For visitors seeking more challenge, 40 percent of the area is in remote and rugged settings, including a network of trails at Panthertown Valley that offer views of the valley's eight major waterfalls. The Backcountry provides visitors with the ability to experience long-distance hiking on trails such as the Bartram Trail, horseback riding and deer and turkey hunting bring visitors away from the roaded areas, and the Chattooga River offers unique backcountry whitewater opportunities. The large granitic domes make the area popular for rock climbers, especially at Big Green and Whiteside Mountain.

Major economic drivers for local communities are tourism, health care, agriculture, and construction. Additionally, due to the area's close proximity to Atlanta, GA and other large urban areas, the region contains many high-value second homes. National Forest System lands provide a wide variety of opportunities for nature-based recreation in support of tourism.

### **Sustaining healthy ecosystems**

The high elevations, rivers, and deep gorges of the Highland Domes support a unique and diverse ecology. The Panthertown area is unique as it is in a high elevation valley within a matrix of dry-mesic, mesic, and acidic cove forests with a cluster of prominent granitic domes overlooking one of the region's largest Southern Appalachian bogs. All ecozones within this geographic area are in need of more young forest conditions. More open forest is needed in mid- to late-seral stages. An overabundance of offsite white pine has impacted the area's species diversity. Peregrine falcon nesting habitat on Whiteside Mountain is critical to maintaining the recovery of the federally de-listed species. The elevations give limited but important opportunities to provide for golden-winged warblers and ruffed grouse. Additionally, this geographic area provides important opportunities to maintain and restore quality habitat for the green salamander.

Rare communities in the region include the high elevation rock outcrops of the granitic domes, which are home to federally endangered rock gnome lichen and numerous SCC plants. Montane acidic cliffs are scattered across the entire area. More spray cliffs, including Whitewater Falls, largest in the southern region, occur in this geographic area compared to all other geographic areas. Numerous nonvascular species of conservation are associated with the numerous spray cliffs. Southern Appalachian bogs within the geographic area support federally listed swamp pink and mountain pitcher plant as many other SCC. They are threatened by woody plant encroachment and non-native invasive plant infestations.

### **Clean and abundant water**

The region's many rivers and waterfalls provide both water and scenic value to the communities that lie within the Highland Domes Geographic Area. Approximately 400 miles of streams and rivers run through the geographic area on National Forest system lands that support native brook trout and a diversity of

other fish species, crayfish, and salamanders. Some of these stream and river miles are characterized by tannic water and sandy substrates that are unique to western North Carolina.

Priority watersheds in the Geographic Area include: Upper and Lower Cullasaja River; Cedar Cliff Lake-Tuckasegee River; Wolf-Creek Tuckasegee River; North Fork French Broad River; Headwaters Chattooga, Upper Chattooga River, and Headwaters West Fork Chattooga River.

## **Goals**

The following goals contribute to identification of management priorities in the Highland Domes Geographic Area. These goals highlight key opportunities and values that will guide Forest Service management and reflect values the Forest Service has heard from the public. These goals are not inclusive of all activities that will occur within the geographic area and do not represent all the values that are present.

### **Sustaining healthy ecosystems**

- HD-GLS-01** Reduce off-site white pine in dry mesic oak, mesic oak, and acidic cove ecozones throughout Southern Escarpment.
- HD-GLS-02** Provide woodland habitats and young forest in oak-dominated and pine-oak heath ecozones to achieve desired conditions for more early and open mid- and late-seral stages. To accomplish this, reduce mesic species encroachment through prescribed burning and harvest at appropriate locations.
- HD-GLS-03** Reduce woody plant encroachment and non-native invasive plants on Southern Appalachian bogs and swamp forest bog complexes, improving habitat for bog turtles, swamp pink, and other rare species in Panthertown Valley and Dulany Bog.
- HD-GLS-04** Protect unique bryophyte lichen and spike moss communities in spray cliff ecozones impacted by heavy recreation use, including canyoneering.
- HD-GLS-05** Continue to preserve pockets of native eastern and Carolina hemlock.
- HD-GLS-06** Continue to support conservation and protection of peregrine falcons through monitoring, seasonal closure of select rock faces, and collaboration with the climbing and recreation community.

### **Providing clean and abundant water**

- HD-GLS-07** Maintain and enhance unique tannic, sandy bottom stream habitat within Panthertown Creek, upper Chattooga River, and Savannah River watersheds to provide quality habitat for native aquatic species.
- HD-GLS-08** Enhance native brook trout populations through improving aquatic organism passage or population augmentation where habitat is suitable.
- HD-GLS-09** In the geographic area, there are five 6th level watersheds identified as areas where the Forest Service will focus resources to improve watershed conditions and function.

### **Connecting people to the land**

- HD-GLS-10** Emphasize interpretive means to convey unique values at Mountain Waters Scenic Byway, Whitewater Falls, Whiteside Mountain, Dry Falls, and the Cullasaja and Whitewater rivers, as they are some of the most highly visited sites in the Forests.

- HD-GLS-11** Provide mid- to high-elevation hunting opportunities through restored forest structural and compositional diversity for white-tailed deer, wild turkey, and ruffed grouse where forest conditions are appropriate.
- HD-GLS-12** Consult and partner with Cherokee Tribes to identify and ensure preservation and protection of special tribal areas and to develop interpretation as appropriate.
- HD-GLS-13** Address supply/demand issues for equestrian and/or bicycle trail opportunities within the geographic area through collaborative trail planning to identify metrics for achieving this goal, appropriate trail mileage for each use-type, new trail locations utilizing sustainable trail design principles, potential adoption of unauthorized routes, sources of construction funding, and long-term maintenance commitments by volunteer and/or partner organizations.

**Places within the area that will be managed in consideration of their unique features**

- HD-GLS-14** Panthertown Valley: Emphasize management actions that support and sustain the unique scenery, recreation activities, and experiences for visitors engaged in sightseeing, hiking, horseback riding, mountain biking, fishing, and climbing:
  - i. Emphasize management that restores and protects rare communities such as Southern Appalachian bog, swamp forest bog complexes, and at-risk species such as rock gnome lichen.
  - ii. Enhance granitic dome plant communities through reduction of NNIS and reduce off-site white pine.
  - iii. Reduce user created trails.
- HD-GLS-15** Cullasaja Gorge:
  - i. Maintain scenic recreation values within the gorge for visitors engaged in hiking and driving.
  - ii. Provide access to waterfall views from roads and trails.
  - iii. Maintain access while sustaining visitor safety at Dry Falls and Bridal Veil Falls, especially in regard to rock falls.
  - iv. Maintain cultural resources and historic values.
- HD-GLS-16** Whiteside Mountain:
  - i. Maintain scenic recreation and traditional cultural values for visitors engaged in sightseeing, hiking, and climbing.
  - ii. Maintain access while sustaining visitor safety.
- HD-GLS-17** Chattooga Wild and Scenic River:
  - i. See the associated management area direction for this corridor.
- HD-GLS-18** Blue Valley:
  - i. Continue to provide high quality fishing experiences and associated primitive dispersed camping opportunities in the Overflow Wilderness Study Area and the Blue Valley Experimental Forest.



## **Partnering with others**

- HD-GLS-19** Continue to work with local and regional chambers of commerce.
- HD-GLS-20** Collaborate with non-government organizations, such as friends groups, trail societies, conservation organizations, recreation organizations, and the state to help manage important resources and social values throughout the geographic area to support the public's diverse use.
- HD-GLS-21** Continue partnership with researchers, including the Southern Research Station in the Blue Valley Experimental Forest and the Highlands Biological Station.
- HD-GLS-22** Continue partnership with NC Wildlife Resources Commission to enhance native brook trout populations and occupied range.
- HD-GLS-23** Continue to participate in the Little Tennessee River Native Fish Conservation Partnership to the benefit of the Cullasaja River and Little Tennessee River watersheds. The rest of the geographic area flows to the Atlantic Slope.
- HD-GLS-24** Work with recreation groups to maintain the integrity and resiliency of rare plant communities and species through site specific management, stewardship, and education.
- HD-GLS-25** Work with recreation groups to maintain and enhance recreation opportunities in the Panthertown Valley while also reducing user-created trails.
- HD-GLS-26** Partner with wilderness and outdoor recreation groups to assist in managing Ellicott Rock Wilderness and the geographic area's wilderness study areas and in educating visitors about wilderness values and ethics and low impact camping and climbing techniques.

## Great Balsam Geographic Area

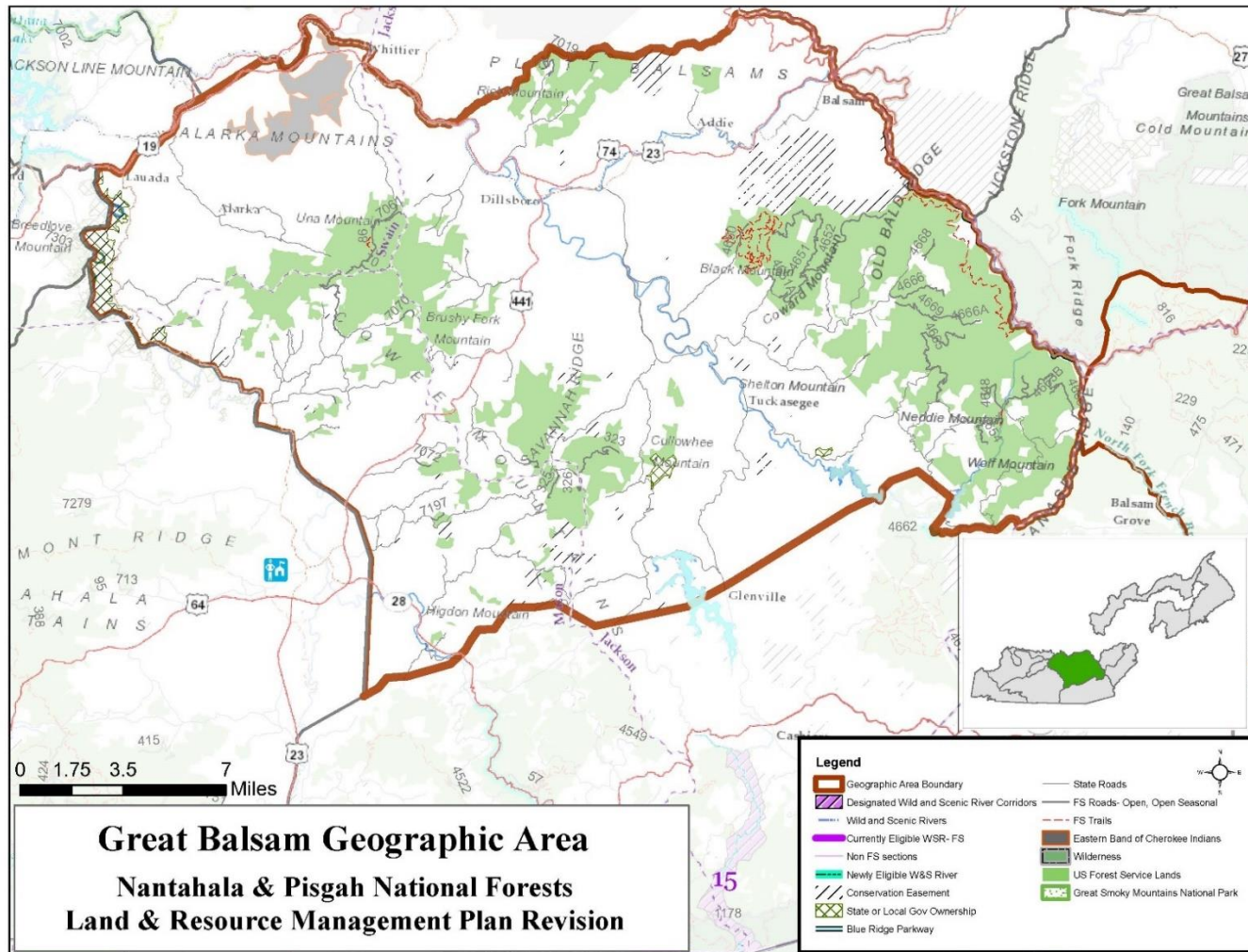


Figure 10. Great Balsam Geographic Area

## Description of area

The broad valleys of the region and summits of the Great Balsam Mountains support a diverse range of mid- and high-elevation forests and high-elevation balds that provide habitat for a diversity of species.

The Great Balsam Geographic Area borders the Cherokee Qualla Boundary, marking the modern home of the Eastern Band of Cherokee Indians. The geographic area contains sites connected to the Creek and Cherokee Tribes (the Eastern Band of Cherokee Indians in North Carolina and the Cherokee Nation and the United Keetoowah Band of Cherokee Indians). Prior to European and Anglo-American intrusions and settlement along with westward expansion, the Great Balsam Geographic Area was home to the Cherokee and Creek Tribes. This area contains several landscape features that figure most prominently in tribal history and have significant meaning to tribal identities and beliefs. These locations serve as some of the most important traditional and ceremonial areas of the Cherokee, including the Judaculla and Cowee landscapes.

The Blue Ridge Parkway borders most of the upper reaches of the Great Balsam Mountains, and the geographic area includes the Parkway's highest point at Richland Balsam (6,053 feet), as well as the Mountains-to-Sea National Recreation Trail. The forest offers backpackers and backcountry hikers an opportunity to experience the region's mountains and waterfalls in solitude. The Moss Knob Shooting Range and the Wayehutta Off-Highway Vehicle use area provide specialized recreation experiences.

Communities within this geographic area include Sylva, Cullowhee, Whittier, and Dillsboro. Cullowhee is the home of Western Carolina University, a public university with an enrollment of over 10,000 students. These communities and others nearby rely on the 66,342 acres of forest land in the geographic area (290,812 acres total) for educational and recreational opportunities. The geographic area is within the Nantahala Ranger District and National Forest System lands within this area lie in Jackson, Macon, and Swain counties.

Management areas within the geographic area include:

- Blue Ridge Parkway corridor
- Bryson Branch botanical area
- Inventoried Roadless Areas

Landmarks within the geographic area that are not managed by the Forest Service include:

- Blue Ridge Parkway (National Park Service)

## Connecting people to the land

The geographic area has great historic significance to the Cherokee and Creek peoples, and the region contains numerous sites connected to community identity. Bordering the Qualla Boundary, the present-day home of many Eastern Band of Cherokee Indians, the geographic area provides tribal members with close access to traditional sites and resource collection areas. The Cowee Bald Lookout Tower is located in this geographic area. This geographic area contains several locations and landscapes that figure most prominently in tribal history and have significant meanings to tribal identities and beliefs. These locations serve as some of the most important traditional and ceremonial areas of the Cherokee. The area contains nine Cherokee towns: Sugartown, Usannah, Alijoy, Stecoa, Oustenaria, Kituwah, Tuckasegee, Caney Fork, and Tanasee Old Town. There are 130.5 miles of pre-contact and historic routes, 5.4 miles which are on the Nantahala National Forest.

The region provides opportunities for scenic driving, day use picnicking, and accessible fishing at Balsam Lake Lodge. Other recreation sites include lake access camps on Bear, Tanasee, and Wolf Lakes and an interpretive trail at a red spruce bog in the Cowee Range.

This geographic area is popular with deer, grouse, turkey, and bear hunters. Additionally, streams and rivers within this geographic area provide anglers high quality trout fishing opportunities.

Tourism, higher education, and health care are all major economic drivers for the local communities. National Forest System lands provide a wide variety of opportunities for nature-based recreation in support of tourism, and both commercial and personal medicinal herb collections contribute to the local economy.

### **Sustaining healthy ecosystems**

Alongside the Southern Appalachian spruce-fir forests, the area contains a blend of productive cove and oak forests, including stands of high elevation red oaks and northern hardwoods. The area contains high elevation forest communities (high elevation red oak forest, northern hardwood, and spruce-fir forest), as well as the special plant communities and wildlife they support. In mid-elevation forests, more regular fire regimes support the diversity of the region's native species.

Structurally, the geographic area has more late closed forest than meets desired conditions. The Roy Taylor portion of this area was heavily managed prior to acquisition by the Forest Service in the 1980s. Efforts since have focused on improving forest structure, composition, and area streams. Habitat enhancement efforts focus on developing ecosystems that support the deer, bear, golden-winged warbler, and ruffed grouse.

Rare habitats in the ecosystem beyond Southern Appalachian spruce-fir forest include a red spruce bog, boulderfields, and beech gaps. Rich cove forests are productive with a diverse herb layer including many medicinal plant species. The Great Balsam Geographic Area's heath balds provide habitat for several species of rhododendron as well as mountain fetterbush.

### **Clean and abundant water**

The geographic area supports approximately 200 miles of streams and rivers including the East and West Forks of the Tuckasegee River and the Tuckasegee River main stem. The geographic area has several small mountain reservoirs at higher elevations.

Dams on the West Fork and East Fork of the Tuckasegee River provides hydroelectric power, and the West Fork main stem Tuckasegee Rivers are used for municipal water supplies.

Priority watersheds in this Geographic Area include: Upper Fontana Lake – Little Tennessee River; Caney Fork; Alarka Creek, Wayehutta Creek-Tuckasegee River; Wolf Creek-Tuckasegee River; Cedar Cliff Lake-Tuckasegee River; North Fork French Broad River; and Lower Cullasaja River.

### **Goals**

The following goals contribute to identification of management priorities in the Great Balsam Geographic Area. These goals highlight key opportunities and values that will guide Forest Service management and reflect values the Forest Service has heard from the public. These goals are not inclusive of all activities that will occur within the geographic area and do not represent all the values that are present.

### **Sustaining healthy ecosystems**

- GB-GLS-01** Conserve and restore high elevation red oak forests, northern hardwood forests, spruce-fir forests, and mesic oak forests. Emphasize restoration of spruce-fir habitat for the Carolina northern flying squirrel, and maintain health and resiliency of this forest type in the face of climate change.
- GB-GLS-02** Reduce off-site white pine and restore hardwood stands.

- GB-GLS-03** Restore degraded lands and conduct mid- and late-seral composition, structural, and habitat management in the Roy Taylor area.
- GB-GLS-04** Restore or maintain the red spruce bogs in Alarka Laurel and Roy Taylor areas to ensure a red spruce and sphagnum moss component is present.
- GB-GLS-05** Enhance, restore, and augment native ginseng populations. Manage permitted collection of American ginseng at sustainable levels.
- GB-GLS-06** Enhance structural conditions for ruffed grouse, deer, and turkey by providing more young forest.
- GB-GLS-07** Maintain open habitats on Old Bald and Sugar Creek Fields to improve habitat for open area-associated species such as golden-winged warbler and ruffed grouse.

### **Providing clean and abundant water**

- GB-GLS-08** Repair damage to area streams in the Roy Taylor area from practices that occurred prior to Forest Service acquisition.
- GB-GLS-09** Provide clean and abundant water to enhance populations of sicklefin redhorse occurring downstream of National Forest System lands.
- GB-GLS-10** Enhance native brook trout where habitat is suitable through restored aquatic organism passage and population augmentation.

### **Connecting people to the land**

- GB-GLS-11** Provide for through-hike opportunities on the Foothills and Mountains-to-Sea trails.
- GB-GLS-12** Maintain accessible stream and lake fishing opportunities at Balsam Lake.
- GB-GLS-13** Enhance hunter access to this area by maintaining and improving existing infrastructure such as parking areas, access roads, trails, and trailheads.
- GB-GLS-14** Provide for sustainable Off Highway Vehicle (OHV) opportunities at the Wayehutta OHV Area.

### **Partnering with others**

- GB-GLS-15** Partner with North Carolina Wildlife Resources Commission to manage for healthy wildlife and aquatic habitats and populations.
- GB-GLS-16** Partner with off-highway vehicle users and user groups to manage Wayehutta OHV area.
- GB-GLS-17** Maintain existing Lake Access Camping Areas.
- GB-GLS-18** Partner with hunting and fishing organizations and groups to assist with access management efforts.
- GB-GLS-19** Partner with the National Park Service regarding management of lands and resources adjacent to the Blue Ridge Parkway.
- GB-GLS-20** Partner with tribes to restore traditional plant species important for tribal arts and culture where possible and practical.
- GB-GLS-21** Consult and partner with Cherokee Tribes to identify and preserve special tribal areas and natural resources.

- GB-GLS-22** Continue to participate in the Sicklefin Redhorse Conservation Committee and the Little Tennessee River Native Fish Conservation Partnership to achieve goals tied to clean and abundant water.
- GB-GLS-23** Partner with trail conservation and maintenance groups, hiking associations, and hiking clubs.

## Nantahala Mountains Geographic Area

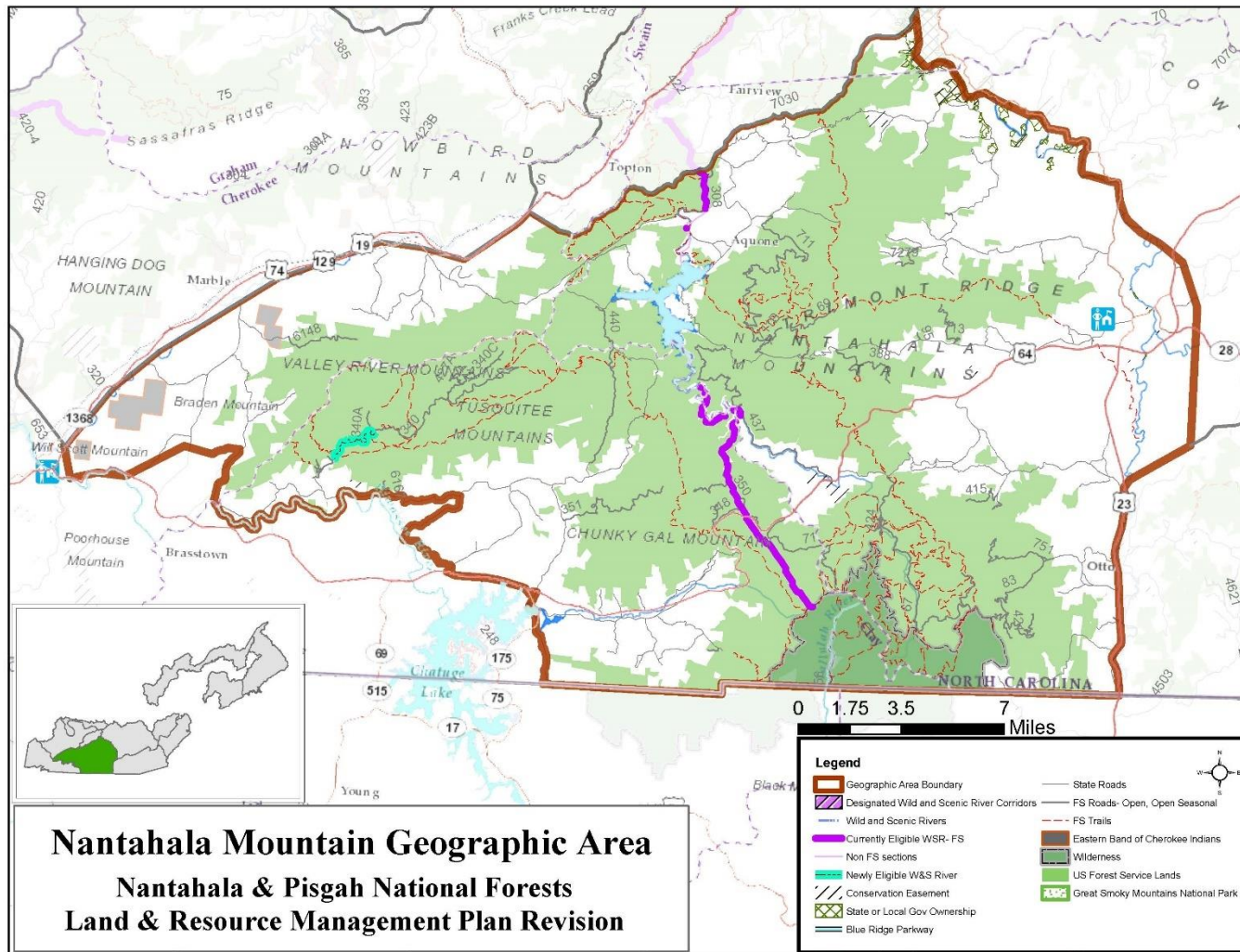


Figure 11. Nantahala Mountains Geographic Area



## Description of area

A land of large, rounded mountains and lush coves, the Nantahala Mountains Geographic Area contains one of the largest contiguous blocks of National Forest System lands on the Nantahala and Pisgah National Forests. The geographic area's vast expanses provide a diverse range of forest uses for visitors and residents.

The Nantahala Mountains provide tens of thousands of acres of remote forest areas for visitors and residents to use and explore. From high elevation heath balds, like Wayah Bald, and weathered rock outcrops to lowland cove and mesic oak/pine forests, the Nantahala Mountains offer a range of biological and scenic diversity special to the National Forests in North Carolina.

Communities within this geographic area include Franklin, Andrews, Upper Peachtree, and Nantahala. These communities and others nearby rely on the 175,660 acres (326,835 acres total) of forest land in the geographic area for recreational opportunities. The region is within the Nantahala and Tusquitee Ranger Districts, and the National Forest System lands within this area lie in Clay, Cherokee, Macon, and Swain counties.

Management areas within the geographic area include:

- Southern Nantahala Wilderness
- Nantahala River Bogs botanical area, Standing Indian Mountain botanical area, Buck Creek  
Serpentine Olivine Barrens botanical area, Runaway Knob botanical area, Riley  
Knob/Chunky Gal Mountain botanical area, and Wildes Cove botanical area
- Appalachian National Scenic Trail
- Trail of Tears National Historic Trail
- Bartram National Recreation Trail
- Mountain Waters Scenic Byway
- Coweeta Hydrologic Laboratory
- Inventoried Roadless Areas
- Nantahala River, portions of which are an eligible Wild and Scenic River; and Fires Creek,  
portions of which are a newly eligible Wild and Scenic River

## Connecting people to the land

Prior to European and American settlement, the lands in the region were home to the Cherokee and Creek Tribes, whose traditions and culture are evidenced in archeological sites in the forest. The Trail of Tears National Historic Trail recognizes the forced removal of the Cherokee and Creek people from the region in 1838. The trail is managed by the Forest Service in consultation and partnership with the Cherokee Tribes in North Carolina and Oklahoma and Creek Tribes in Oklahoma, Alabama, Louisiana, and Texas. The geographic area includes eighteen Cherokee towns: Kewoche, Shooting Creek, Tusquitee, Aquonastuee, Little Tellico, Nikwasi, Tasse, Echey, Aquone, Nowee, Watauga, Cowee, Loree, Burningtown, Cowitchee, Coweeta, Tessentee, and Canucca. This area contains 167.9 miles of pre-contact and early historic routes, 49.7 miles of which are on the Nantahala National Forest.

The Nantahala Mountains are the largest geographic area in the Forests, and the geographic area's large block of contiguous ownership provides visitors with multiple access points for long-distance hiking, climbing, hunting, highly developed camping, group camping, horseback riding, and shooting sports. The Forest Service provides opportunities for camping, hiking (from day trips to extended Backcountry and Wilderness excursions on trails such as the Bartram National Recreation Trail), as well as horse and pack riding in the Standing Indian Basin, Fires Creek, Chunky Gal Trail, and Rim Trail. The area provides a mix



of developed, primitive, and dispersed camping opportunities, including the Standing Indian Campground and Appletree Campground, Kimsey Creek and Hurricane Creek Camps, and the Hunters Camp and Bristol Fields Horse Camp in the Fires Creek watershed.

The area's creeks and rivers are popular destination spots for fishing, tubing, picnicking, and dispersed camping. Anglers enjoy the many creeks and river headwaters as well as the high mountain Nantahala Lake with waters that flow into the Hiwassee, Nantahala, Little Tennessee, and Tallulah Rivers. The Dirty John Shooting Range provides opportunities for rifle and pistol shooting in a safe and environmentally sound area. Hunting is an important traditional and recreational activity, as the geographic area provides quality habitat for ruffed grouse, wild turkey, white tailed deer, and black bear. These mountains are the setting for multiple Louis L'Amour novels of the famed Sackett family.

Major economic drivers for local communities include tourism, health care, agriculture, manufacturing, and mineral extraction. National Forest System lands provide permits for some mineral leasing operations. Additionally, these lands are considered a major tourism asset for local communities, and the geographic area is popular for both commercial and personal medicinal herb collections and ramps.

Ramps and medicinal plants are harvested across this geographic area at a greater rate than all other geographic areas.

### **Sustaining healthy ecosystems**

The Nantahala Geographic Area supports all the common ecozones except for spruce–fir forests. Mesic mid-elevation habitats such as acidic cove, rich cove, and mesic oak forests are particularly abundant within this geographic area.

Restoration efforts in the geographic area are focused on using silvicultural techniques to create needed young forest habitat in mesic oak, high elevation red oak, pine-oak heath, acidic cove, and rich cove forests. Young forest within these areas can provide habitat for grouse and golden-winged warbler priority areas within the geographic area. Woodland habitat gaps identified in the geographic area are in both mid and older forests of high elevation red oak, mesic oak, acidic cove, dry-mesic oak, dry oak, and pine-oak heath forests. The greatest needs for more old growth forest in the geographic area are in rich cove, acidic cove, and mesic oak forests.

The Nantahala Mountains Geographic Area are home to a wide range of rare habitats including Southern Appalachian bogs, boulderfields, heath balds, abandoned mine shafts that provide bat hibernacula, montane red cedar woodlands, montane cliffs, low elevation glades, and serpentine woodlands. Buck Creek serpentine barrens includes two endemic plant communities, two endemic newly described plant species, and numerous SCC.

### **Clean and abundant water**

The Nantahala Mountains Geographic Area supports many high quality streams and rivers including the Fires Creek and Buck Creek watersheds, parts of the Hiwassee, Nantahala, and Little Tennessee Rivers, and the Tallulah River headwaters. The town of Franklin gets its water supply from the geographic area.

Approximately 640 miles of creeks and rivers run through the geographic area on National Forest System lands.

Priority watersheds in this Geographic Area include: Buck Creek, Fires Creek, Lower Cullasaja River, and Wolf Creek-Tuckasegee River.

### **Goals**

The following goals contribute to identification of management priorities in the Nantahala Mountains Geographic Area. These goals highlight key opportunities and values that will guide Forest Service

management and reflect values the Forest Service has heard from the public. These goals are not inclusive of all activities that will occur within the geographic area and do not represent all the values that are present.

### **Sustaining healthy ecosystems**

- NM-GLS-01** Restore and maintain age class and structural diversity utilizing a range of management approaches with focus on the mesic oak, high elevation red oak, pine-oak heath, acidic cove, and rich cove forests.
- NM-GLS-02** Restore woodland characteristics and other structural and compositional conditions in high-elevation red oak, mesic oak, dry-mesic oak, dry oak, and pine oak heath forests.
- NM-GLS-03** Reduce off-site species, especially white pine, and improve hunting opportunities for a range of game species across the area.
- NM-GLS-04** Maintain and restore serpentine and red cedar woodlands with fire. Reduce impacts from non-native invasive plants.
- NM-GLS-05** Maintain and restore native populations of ginseng. Manage permitted collection of American ginseng at sustainable levels.
- NM-GLS-06** Ensure sustainable harvest of ramps and diverse selection of medicinal plants.
- NM-GLS-07** Reduce woody plant encroachment and non-native invasive plants within Southern Appalachian bogs.

### **Providing clean and abundant water**

- NM-GLS-08** Maintain and expand range of native brook trout and restore stream passage for aquatic organisms.
- NM-GLS-09** Maintain water quality for hellbenders in waters that support them.
- NM-GLS-10** Consider the potential for acid-bearing geological formations in project planning.
- NM-GLS-11** The geographic area contains two 6<sup>th</sup> level priority watersheds targeted by the Forest Service for restoration.

### **Connecting people to the land**

- NM-GLS-12** Maintain and balance access for a diverse range of recreation opportunities, settings, and experiences across the area, including sites for developed and dispersed camping, day-use, long-distance hiking, day-hiking, horseback riding, and water sports.
- NM-GLS-13** Respond to demand for quality hunting opportunities for ruffed grouse, wild turkey, white-tailed deer, and black bear by maintaining and enhancing habitat in partnership with the North Carolina Wildlife Resources Commission.
- NM-GLS-14** Expand scientific forest research aimed at restoration of sites impacted by an overabundance of white pine.

### **Places within the geographic area that are recognized and managed in consideration of their unique features**

- NM-GLS-15** The Trail of Tears National Historic Trail is listed on the National Register of Historic Places and is a Native American Traditional Cultural Property managed in consultation

with tribes and National Park Service for its preservation, protection, restoration, and interpretation – see the Heritage Corridor Management Area.

**NM-GLS-16** Standing Indian Basin:

- i. Continue to provide a mix of recreational opportunities, including developed and tent camping, hiking, horseback riding, fishing, day use, and Backcountry access.

**NM-GLS-17** Fires Creek Watershed:

- i. Continue to provide a mix of recreational opportunities, including developed and tent camping, hiking, horseback riding, fishing, day use, and Backcountry access.

**Partnering with others**

**NM-GLS-18** Continue strengthening partnerships with volunteer organizations to reduce deferred maintenance and increase sustainability of trail and developed and dispersed recreation infrastructure .

**NM-GLS-19** Work with local communities, county governments, and chambers of commerce.

**NM-GLS-20** Partner with tribes and the National Park Service to manage the Trail of Tears and Unicoi Turnpike corridor and restore traditional plant species important for tribal traditions, culture, and arts.

**NM-GLS-21** Continue partnership with North Carolina Wildlife Resources Commission to expand the range of native brook trout.

**NM-GLS-22** Continue to participate in the Sicklefin Redhorse Conservation Committee and the Little Tennessee River Native Fish Conservation Partnership to meet goals in providing clean and abundant water.

**NM-GLS-23** Partner with wilderness and outdoor recreation groups to assist in managing Southern Nantahala Wilderness and in educating visitors about wilderness values and ethics and low impact camping and climbing techniques.

## Nantahala Gorge Geographic Area

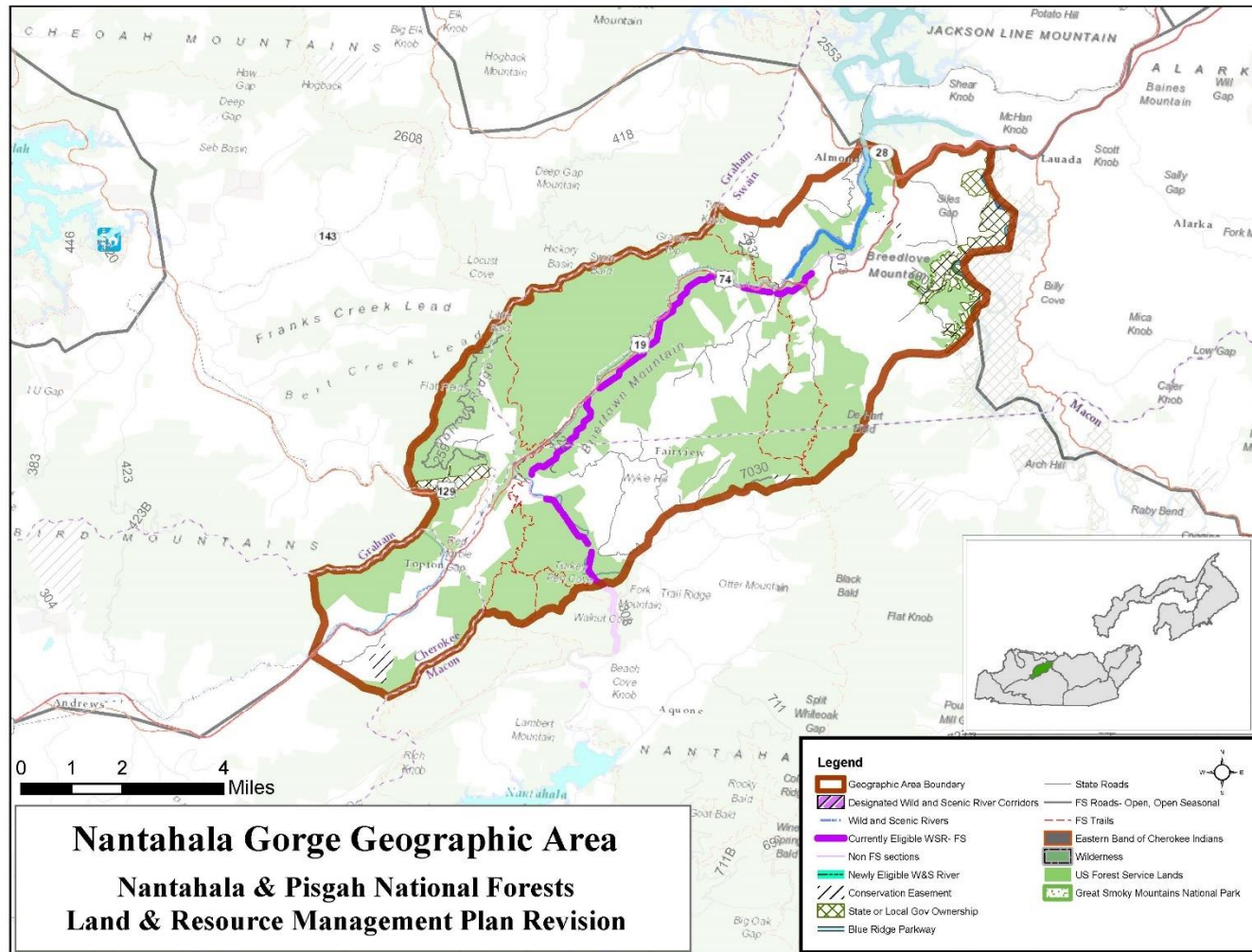


Figure 12. Nantahala Gorge Geographic Area

## **Description of area**

The central feature of the Nantahala Gorge Geographic Area is the river that gives the region its name. The Nantahala River cuts a deep gorge that runs for eight miles within the river's 40-mile descent from its headwaters in the Nantahala Mountains to its confluence with the Little Tennessee River. The gorge is famous for its whitewater rapids that bring thousands of visitors to the region each year.

As it flows down from the Southern Nantahala Wilderness to its terminus at Fontana Lake, the river descends an average 38 feet per mile. This steep gradient creates the whitewater rapids that draw visitors for rafting and fly fishing along the lower section of the gorge. The upper section is more rugged and creates many rapids along its length, and the remote surroundings create ideal conditions for extremely rugged cross country hiking.

This area contains several landscape features that figure most prominently in tribal history and have significant meaning to tribal identities and beliefs. The Nantahala Gorge tribal landscape serves as one of the most important traditional areas of the Cherokee.

The diverse ecosystems within the gorge are dominated by rich cove forests, interspersed with acidic cove and oak forests. These lower slopes are vital to the persistence of the noonday globe. At higher elevations, weathered rock outcrops give way to mountain top heath balds such as Wesser Bald and Lowing Bald. The lower end of the geographic area includes motor boat access to the upper end of Fontana Lake and the Finger Lake Day Use Area, which provides a venue for kayak instruction for outfitters and guides. Natural caves and abandoned mines within the Nantahala Gorge provide habitat for bats and other cave-associated species.

Communities in the geographic area include Tipton and the town of Nantahala. These communities rely on the 21,820 acres of forest land in the geographic area (41,589 acres total). The majority of the geographic area is within the Nantahala Ranger District with a small portion in the Cheoah and Tusquiee Ranger Districts. National Forest System lands within the area lie in Macon, Cherokee, and Graham counties.

Management areas within the geographic area include:

- Appalachian National Scenic Trail
- Trail of Tears National Historic Trail
- Bartram National Recreation Trail
- Nantahala Gorge, including Blowing Springs botanical/zoological area
- Camp Branch Falls botanical area
- Nantahala River, portions of which are an eligible Wild and Scenic River
- Inventoried Roadless Areas

## **Connecting people to the land**

Within this geographic area the Trail of Tears National Historic Trail recognizes the forced removal of the Cherokee and Creek people from the region in 1838. The trail is managed by the Forest Service in consultation and partnership with the Cherokee Tribes in North Carolina and Oklahoma and Creek Tribes in Oklahoma, Alabama, Louisiana, and Texas. The geographic area includes the Cherokee towns of Chinleantlee and Nantahala. This area also contains 35.3 miles of Native American pre-contact and early historic routes, 11 miles of which are on the Nantahala National Forest.

The Forest Service provides permits for multiple whitewater rafting outfitters and guides. The Nantahala River is one of the most heavily visited sites on the Forests, and rafting brings tourists to the geographic

area each year. Trout fishing is a popular activity in the upper and lower sections of the Nantahala Gorge, including guided fly fishing boat trips in the gorge itself.

The high level of visitation on the river provides a major benefit to the economies of local communities. Businesses in nearby towns and throughout the lower gorge offer visitors access to outfitting services, lodging, retail, and campgrounds, creating jobs for local residents and seasonal workers such as raft guides.

The major economic driver for local communities is tourism. National Forest System lands provide a wide variety of opportunities for nature-based recreation in support of tourism. The Appalachian National Trail and Bartram National Scenic Recreation Trail cross through the geographic area and attract hikers looking for challenging technical hikes and hunters seeking grouse, deer, turkey, and bear. Additionally, local communities benefit from water-based recreation with multiple outfitters and guides basing their operations on the Nantahala River.

### **Sustaining healthy ecosystems**

Forest communities within the Nantahala Gorge include dry-mesic oak, mesic oak, rich cove, and acidic cove forests. Within mature tracts of the forest, cerulean warbler habitat exists. Oak and scattered pine ecozones are more abundant across the south-facing slopes which include partially open fire adapted species and provide an opportunity for increasing an open woodland structure.

Rare ecological communities in this area include acidic shale slope woodlands and calcareous cliffs as well as caves and forest habitat that support several rare bat species, including the endangered Indiana bat and the threatened northern long-eared bat. The lower gorge supports the only known population of the federally listed threatened noonday globe (a terrestrial snail).

### **Clean and abundant water**

The Nantahala River and the surrounding geography are the primary features of this geographic area. Tributary creeks such as Queens, White Oak, and Dick Creeks feed into the river. As the Nantahala River leaves the gorge, it flows into Fontana Lake which provides nearby communities with hydroelectric power via the Fontana Dam.

Approximately 106 miles of streams and rivers run through the geographic area on National Forest System lands.

Priority watersheds in this Geographic Area include Upper Fontana Lake-Little Tennessee River.

### **Goals**

The following goals contribute to identification of management priorities in the Nantahala Gorge Geographic Area. These goals highlight key opportunities and values that will guide Forest Service management and reflect values the Forest Service has heard from the public. These goals are not inclusive of all activities that will occur within the geographic area and do not represent all the values that are present.

### **Sustaining healthy ecosystems**

- NG-GLS-01**     Protect cave habitats within Nantahala Gorge, including Blowing Springs, for all species with a focus on Indiana, northern long-eared, and gray bats, and the lost Nantahala cave spider.
- NG-GLS-02**     Maintain and restore intact forest habitat for the noonday globe.

- NG-GLS-03**     Manage non-native invasive species, prioritizing the rich cove forest with the greatest diversity of rare and common species.
- NG-GLS-04**     Enhance woodland habitat within dry-mesic oak, mesic oak, and pine-oak heath forests with recurrent prescribed burning.

#### **Providing clean and abundant water**

- NG-GLS-05**     Manage river access through permits and infrastructure to minimize nonpoint-source water pollution.
- NG-GLS-06**     Enhance hellbender and native brook trout populations where habitat is suitable.

#### **Connecting people to the land**

- NG-GLS-07**     Manage the river for sustainable recreation by continuing to limit commercial weekend use on high-use weekends and limit the number of outfitter and guide permits authorized to operate on the river.
- NG-GLS-08**     Emphasize scenery for Mountain Waters Scenic Byway, Appalachian Trail, and Bartram Trail.
- NG-GLS-09**     Maintain remote hike-only opportunities in Cheoah Bald IRA, London Bald, and Wesser Bald areas.

#### **Places within the geographic area that are recognized and managed in consideration of their unique features**

- NG-GLS-10**     The Trail of Tears National Historic Trail is listed on the National Register of Historic Places and is a Native American Traditional Cultural Property managed in consultation with tribes and the National Park Service for its preservation, protection, restoration, and interpretation.

#### **Partnering with others**

- NG-GLS-11**     Continue working with the Nantahala Gorge Association to encourage use by diverse groups.
- NG-GLS-12**     Work with Duke Energy Corporation on partnership projects and additional recreational releases to support special events.
- NG-GLS-13**     Continue partnership with the North Carolina Wildlife Resources Commission on fisheries resource management and the North Carolina Department of Transportation on the Nantahala River Bike Trail.
- NG-GLS-14**     Partner with tribes and the National Park Service to manage the Trail of Tears corridor and restore traditional plant species important for tribal traditions, culture, and arts.
- NG-GLS-15**     Continue to participate in the Sicklefin Redhorse Conservation Committee and the Little Tennessee River Native Fish Conservation Partnership to meet goals in providing clean and abundant water.

## Fontana Lake Geographic Area

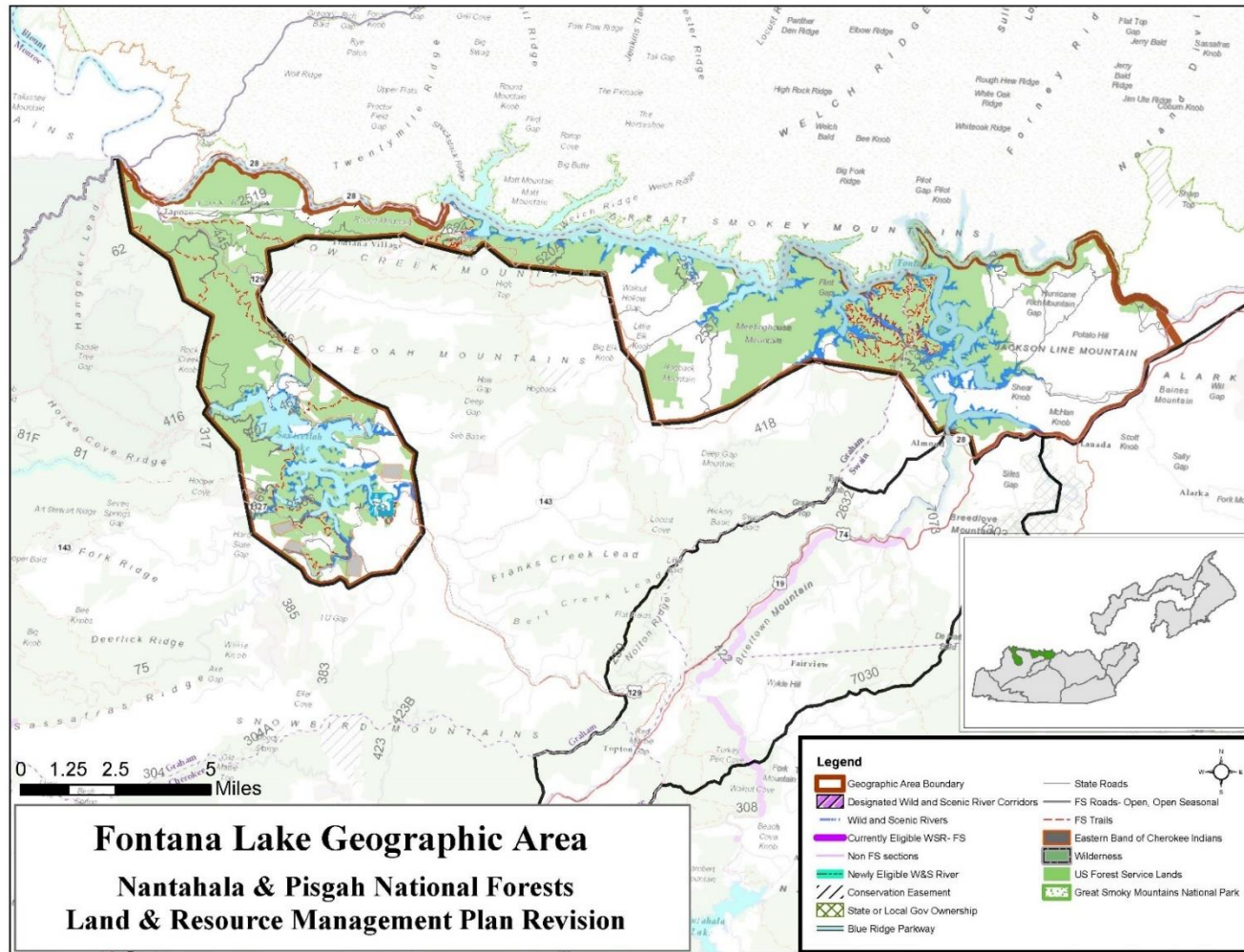


Figure 13. Fontana Lake Geographic Area



## **Description of area**

Bordered by surrounding mountain ranges, the wide valleys and lakes of the Fontana Lake Geographic Area provide an accessible region for visitors to enjoy boating, camping, fishing, mountain biking, and hiking. The defining characteristic of the geographic area are the man-made lakes created by the Cheoah and Santeetlah Dams and constructed by the Tallassee Power Company (Tapoco) and the Fontana Dam, which was constructed by the Tennessee Valley Authority (TVA). These hydroelectric dams across the Little Tennessee River and Cheoah Rivers form the lakes and provide recreation and hydroelectric power to nearby communities.

Prior to European and Anglo-American settlement and westward expansion, the Fontana Lake geographic area was home to the Cherokee and Creek Tribes. This area contains several landscape features that figure most prominently in tribal history and have significant meaning to tribal identities and beliefs. These locations serve as some of the most important traditional and ceremonial areas of the Cherokee.

For 16.7 miles, the Fontana Lake geographic area stretches out along the historic course of the Little Tennessee River, the southern border of the Great Smoky Mountains National Park. The geographic area encompasses the majority of Fontana Lake's shoreline with 5,032 acres of lakefront contained within its borders. South of Fontana Lake near Robbinsville, the smaller Santeetlah Lake stretches across 2,625 acres of shoreline. More than 75 percent of the lands bordering Santeetlah Lake are within the Nantahala National Forest, and the valleys bordering both lakes are filled with shortleaf pine and oak forests that provide habitat for game and non-game wildlife. The area also includes Cheoah and Calderwood Lakes.

The low elevation and developed road networks of the geographic area make this area easily accessible by motor vehicles. The Forest Service, in partnership with the North Carolina Wildlife Resources Commission, maintains several boat launches that allow visitors to enjoy recreation and fishing on the lakes by motorboats, kayaks, and canoes. Developed and dispersed camping provide multiple opportunities for nature-based recreation by forest visitors.

Communities nearby this geographic area include Bryson City, Robbinsville, and Fontana Village. These communities and others nearby rely on the 33,413 acres of forest land in the geographic area (111,437 acres total). The region is within the Cheoah Ranger District and a small portion of the Nantahala Ranger District. National Forest System lands within this area lie in Graham and Swain counties.

Management areas within the geographic area include:

- Appalachian National Scenic Trail Corridor
- Trail of Tears National Historic Trail
- Inventoried Roadless Areas

Landmarks within the geographic area that are not managed by the Forest Service include:

- Fontana Dam and Visitors Center

## **Connecting people to the land**

Prior to European and American settlement, the lands in the area were home to the Cherokee and Creek Tribes. The Trail of Tears National Historic Trail recognizes the forced removal of the Cherokee and Creek people from the region in 1838. The trail is managed by the Forest Service in consultation and partnership with the Cherokee Tribes in North Carolina and Oklahoma and Creek Tribes in Oklahoma, Alabama, Louisiana, and Texas. Four Cherokee towns - Cheoah, Buffalo Town, Alarka, and Little Stecoah

- are located in this geographic area. This area contains 71.6 miles of pre-contact and early historic routes, 14.6 miles of which are on the Nantahala National Forest.

The Santeetlah Dam, constructed in 1928 by the Tallassee Power Company, is recognized on the National Register of Historic Places. The Tennessee Valley Authority (TVA) built Fontana Dam in 1944 as a flood control measure as well as a way to provide hydroelectric power to nearby communities.

Local communities benefit from National Forest System lands through hunting and tourism. The rivers and forests that surround the lakes provide hunters with opportunities for deer, turkey, ruffed grouse, and bear hunting. With multiple sites for river and lake access, the area is also popular with anglers seeking walleye and bass.

Water-based recreation on the lakes is central to the geographic area. These lakes are one of the most popular attractions for visitors. The Forests, in partnership with the North Carolina Wildlife Resources Commission, maintain boat launches on the reservoirs for motor boats, and houseboats are a frequent sight on the Fontana Lake during the warmer months. The rapids along the Cheoah River attract whitewater rafters. The area is very popular with motorcycle riders who use the highways in Graham County to access the Cherohala Skyway and the portion of U.S. Highway 129 - - The Tail of the Dragon - - between North Carolina and Tennessee. Because of the road and water-based nature of the region's attractions, the area sees the largest seasonal fluctuation in visitors during the winter months of all of the Forests' geographic areas.

The geographic area contains multiple sites for developed and dispersed camping around Santeetlah Lake and Fontana Lake, including Cheoah Point Campground and Cable Cove Campground. The Tsali Recreation Area on Fontana Lake provides access for mountain biking and horseback riding, which draws national recognition, as well as boating and developed camping. Hiking is popular on the Benton MacKaye Trail and the Appalachian Trail. The resort community Fontana Village is also a major attraction for visitors to this geographic area.

### **Sustaining healthy ecosystems**

The low elevation and abundant water of the region primarily support shortleaf pine, dry-mesic oak, rich cove, and acidic cove forests that provide habitat for larger mammals, such as deer and bear, as well as bird species including turkey, golden cerulean warbler, eastern whip-poor-will, ruffed grouse, and other non-game species.

The abundant shortleaf pine forest is home to many fire-adapted plant species including several SCC. Due to the historical abundance of southern pine species, the native southern pine beetle has repeatedly reached outbreak levels altering the species composition within the forests of this geographic area.

Restoration efforts will focus on increasing the resilience of the forest to southern pine beetle infestations and outbreaks, conducting timber stand improvement projects on degraded forest types, and increasing the amount of habitat for cerulean warblers, eastern whip-poor-wills, and other songbirds. Rare habitats in the region include patches of rocky bar and shore and montane alluvial forest along the lakes and low elevation basic glades on scattered upper slopes. Bald eagles nest along reservoir shorelines in this geographic area.

### **Clean and abundant water**

Water defines the nature of the geographic area. The course of the Little Tennessee River and Cheoah River shaped the landscape and provided the waters for the surrounding pine and oak forests. With the damming of Lake Santeetlah in 1926 and Fontana Lake in 1942, the rivers swelled into lakes that provide

hydroelectric power to nearby communities. The Nantahala River terminates its course in the geographic area, emptying into the Little Tennessee at Fontana Lake.

The Cheoah River supports several federally listed aquatic animal and plant species, including the endangered Appalachian elktoe, threatened spotfin chub, and threatened Virginia Spiraea which is the most abundant population known across North Carolina. It has been the subject of interagency efforts to restore the native fish community for the last several years. Non-native invasive plant species infestations threaten the Virginia Spiraea population and other associated SCC plants.

Approximately 130 miles of creeks and rivers run through the geographic area on National Forest System lands.

Priority watersheds in this Geographic Area include: Yellow Creek-Cheoah River; Santeetlah Creek; Alarka Creek; and Lower and Upper Fontana Lake-Little Tennessee River.

## **Goals**

The following goals contribute to identification of management priorities in the Fontana Lake Geographic Area. These goals highlight key opportunities and values that will guide Forest Service management and reflect values the Forest Service has heard from the public. These goals are not inclusive of all activities that will occur within the geographic area and do not represent all the values that are present.

### **Sustaining healthy ecosystems**

- FL-GLS-01**    Emphasize active restoration, maintenance, and management of shortleaf pine forests using timber harvest and prescribed fire to maintain southern pine beetle at endemic levels.
- FL-GLS-02**    Conducting stand improvement and other restoration projects on forest communities degraded by past management and forest health impacts like southern pine beetle.
- FL-GLS-03**    Increasing the amount of habitat for warblers and eastern whip-poor-will.
- FL-GLS-04**    Restore structural and compositional diversity to enhance habitat for game species such as white-tailed deer and wild turkey as well as bald eagles and neotropical migratory birds.
- FL-GLS-05**    Protect bald eagle nesting locations within the geographic area.

### **Providing clean and abundance water**

- FL-GLS-06**    Enhance populations of sicklefin redhorse, one of the rarest fish species in North Carolina and culturally important to the Eastern Band of the Cherokee Indians, through augmentation or reintroduction where habitat is suitable.
- FL-GLS-07**    Enhance native brook trout populations, the only salmonid native to the southeastern United States, where habitat is suitable.
- FL-GLS-08**    There are five 6<sup>th</sup> level watersheds identified as areas where the Forest Service will focus resources to improve watershed conditions and function.

### **Connecting people to the land**

- FL-GLS-09**    Emphasize water-based recreation around Santeetlah and Fontana Lakes. Provide accessto the shore and water and support recreational boating, fishing, camping, and trail opportunities.

- FL-GLS-10** Promote sustainable access and opportunities to support the local economy along the lakeshores that do not compromise scenic or recreational experiences.
- FL-GLS-11** Support recreational opportunities and access to the Cheoah River.
- FL-GLS-12** Enhance mountain biking opportunities along Santeetlah Lake and near Fontana Village, and emphasize horse and bike use at Tsali Recreation Area. Continue to provide hiking opportunities.

**Places within the area that will be managed in consideration of their unique features**

- FL-GLS-13** Appalachian Trail and Benton MacKaye Trail.
- FL-GLS-14** Cheoah River:
  - i. Restore aquatic habitat and fish and freshwater mussel communities within the river.
  - ii. Restore montane alluvial forest along the river and ensure non-native invasive plant species are not impacting Virginia Spiraea.
  - iii. Provide for river access and maintain and enhance recreation opportunities.

**Partnering with others**

- FL-GLS-15** Continue partnerships with North Carolina Wildlife Resources Commission for boat access at lakes and to enhance native brook trout.
- FL-GLS-16** Continue working with partnerships and volunteers to maintain and improve hiking trails, mountain biking, and horseback riding opportunities.
- FL-GLS-17** Continue to work with marina and mooring point special use permit holders to modernize and improve water-based recreation.
- FL-GLS-18** Partner with tribes to manage and restore traditional plant species important for tribal traditions, culture, and arts.
- FL-GLS-19** Work collaboratively with Tennessee Valley Authority (TVA) to address conflicts with mooring, recreation opportunities, and heritage resource concerns.
- FL-GLS-20** Work with local governments, elected officials, and tourism boards on community development, sustainable recreation, and infrastructure management, and to support additional access in winter months to extend the recreation season.
- FL-GLS-21** Continue to participate in the Sicklefin Redhorse Conservation Committee and the Little Tennessee River Native Fish Conservation Partnership to meet clean and abundant water goals.

## Hiwassee Geographic Area

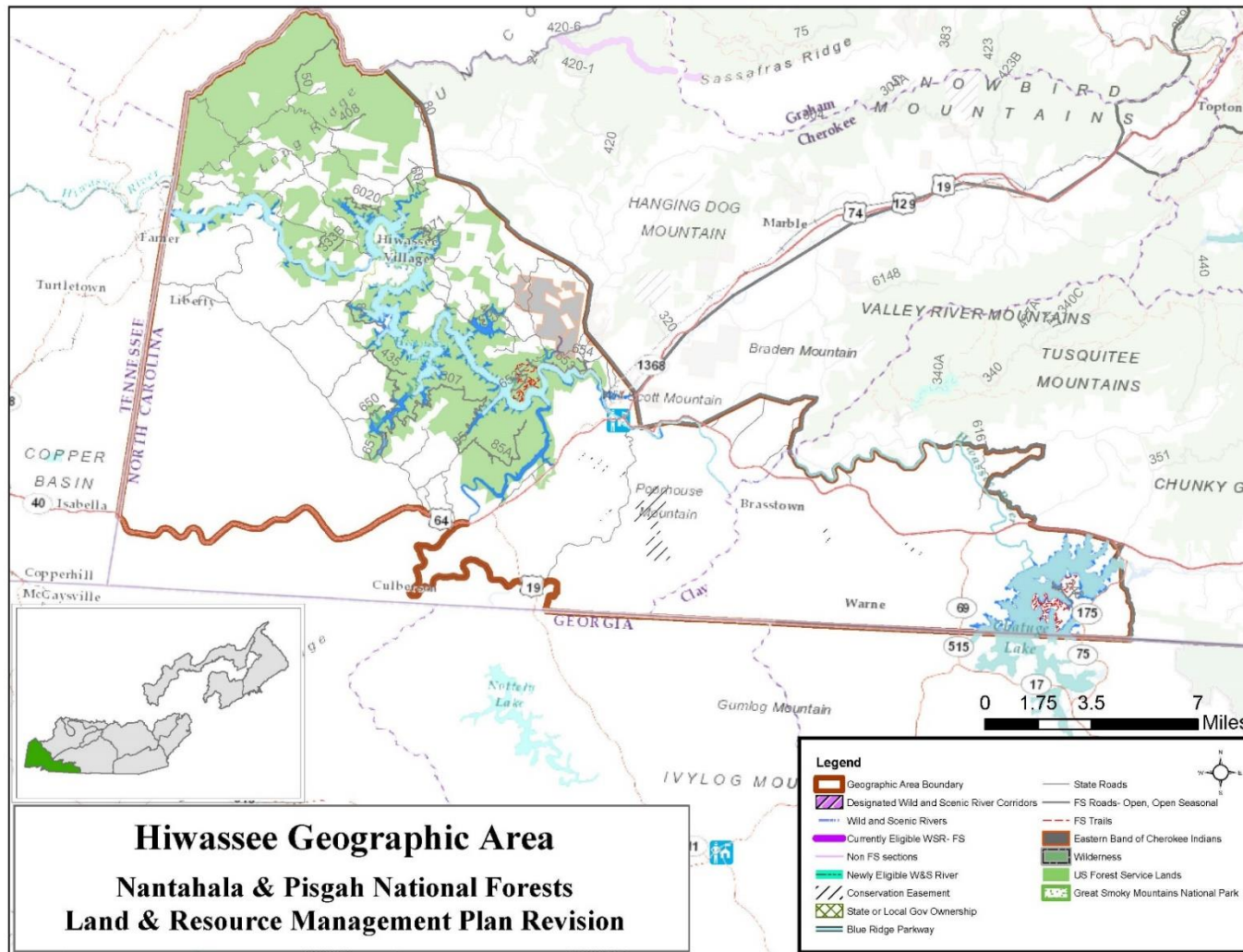


Figure 14. Hiwassee Geographic Area

## **Description of area**

The Hiwassee Geographic Area is defined by large rivers running through broad flat valleys and two large lakes surrounded by mountains that provide distinct visitor experiences. The broad river valleys lie at lower elevations than other geographic areas in North Carolina's National Forests. The steep mountains of this area support short leaf pine, mixed hardwood forests, and large pockets of eastern hemlock.

Passing through a gentler mountain landscape, the major rivers of the region include the Hiwassee, Valley, and Nottley Rivers which flow into the Chatuge, Hiwassee, and Apalachia lakes. These rivers and the lakes created by TVA dams provide recreational opportunities for fishing, boating, and other water sports. The lakes of this geographic area form a chain that is home to a diverse number of plant, animal, and warm water fish species that are native to riparian floodplain ecosystems.

Prior to European and Anglo-American settlement and westward expansion, the Hiwassee geographic area was home to the Cherokee and Creek Tribes. This area contains several landscape features that figure most prominently in tribal history and have significant meaning to tribal identities and beliefs. These locations are important traditional and ceremonial areas for the Cherokee.

Communities within this geographic area include Murphy, Hayesville, Warne, Peachtree, Brasstown, Hiwassee Dam, Ranger, and the smaller incorporated areas of Unaka and Violet. National Forest System lands within this area lie in Cherokee and Clay counties. The region is within the Tusquitee Ranger District.

Management areas within the geographic area include:

Trail of Tears National Historic Trail

## **Connecting people to the land**

Cherokee and Creek traditions and culture are showcased in archeological sites in the Forests. The Trail of Tears National Historic Trail runs through the area, incorporating sections of the Unicoi Turnpike, Georgia Road, and the Great State Road and runs from Franklin to Fort Butler. These trails and roads were used to remove Cherokee and Creek Tribal members from their traditional homelands in western North Carolina and North Georgia. The Hiwassee Geographic Area includes six Cherokee towns: Hiwassee, Tusquitee, Brasstown, Chowee, Quanassee, and Canuce. The area contains 127.7 miles of pre-contact and early historic routes, 9.7 miles of which are on the Nantahala National Forest.

Modern historical sites include the TVA-built Chatuge Dam, Hiwassee Dam, and Apalachia Dam, which provide hydroelectric power to neighboring communities. These impoundments support water-based recreational activities, and the Forest manages public access points such as marinas and boat ramps. The Panther Top Fire Tower in this area is a National Historic Register-eligible site.

With almost three quarters of the geographic area accessible by car, the area draws visitors from neighboring states for sightseeing, motor boat access, fishing, biking, and hiking. The proximity of the rivers and lakes to the region's roads, developed campsites, and boat launches provides easy access to recreational opportunities for day visitors from North Carolina and neighboring states. Mountain bikers can enjoy dedicated mountain bike trails at Jackrabbit Mountain and Hanging Dog. The Panther Top Shooting Range provides opportunities for target practice with rifles and pistols. This area also has the Benton MacKaye Trail, a long-distance trail.

The less developed portions of the geographic area provide habitats supporting populations of game, especially deer, turkey, and bear, and non-game wildlife such as blue-winged warblers, eastern whip-poor-will, and Chuck-will's-widow, which is popular with hunters and bird watchers.

Major economic drivers for local communities include manufacturing, health care, agriculture, wood products, and tourism. National Forest System lands provide a wide variety of opportunities for nature-based recreation. Additionally, the communities in the geographic area rely on the land and water of the lakes for flood safety and power.

### **Sustaining healthy ecosystems**

The geographic area supports the largest acreage of shortleaf pine among the geographic areas on the Nantahala and Pisgah National Forests. Shortleaf pine and mixed hardwood forests would have been the dominant ecosystem. Historically, these forest types would have featured large tracts of predominantly hardwoods in acidic cove, dry-mesic oak, and montane oak heath forests but have been encroached by white pine as a consequence of past management practices and fire suppression.

The abundance of sites suitable for shortleaf pine in the area present an opportunity to improve the structure and composition of remaining shortleaf stands to contribute to a healthy forest that can better address catastrophic fire, climate change, and impacts from insects and disease. The forest requires fire to maintain fire dependent plant assemblages, to improve forest health and habitat quality, and to reduce off-site pine in both the shortleaf pine and dry-mesic oak forests. Young forest and woodlands are important to wildlife in these areas.

Rare habitats within the geographic area are more abundant across the lower elevations and include montane cliffs, low elevation glades, low elevation seeps, and floodplain pools. These habitats provide important breeding ground for amphibians and a diversity of wetland plants.

### **Clean and abundant water**

The geographic area is defined by the waters that flow from the surrounding peaks and mountains into the area's many creeks and rivers. Approximately 101 miles of creeks and rivers run through the geographic area on National Forest System lands. Reservoirs formed by Tennessee Valley Authority dams provide recreation and drinking water to the communities in the region.

The geographic area contains geology with high concentrations of sulfide minerals. When exposed by excavation or landslides, these acid-producing rocks can degrade water quality in the immediate area and downstream via runoff or if the rocks are used in embankments or stockpiled in waste areas.

Priority watersheds for this Geographic Area include Shuler Creek.

### **Goals**

The following goals contribute to identification of management priorities in the Hiwassee Geographic Area. These goals highlight key opportunities and values that will guide Forest Service management and reflect values the Forest Service has heard from the public. These goals are not inclusive of all activities that will occur within the geographic area and do not represent all the values that are present.

### **Sustaining healthy ecosystems**

- HW-GLS-01** This geographic area contains the largest shortleaf pine belt across the forest. Restoration activities will emphasize this shortleaf pine as well as associated ecozones such as dry oak, pine oak/heath, and dry-mesic oak.
- HW-GLS-02** Shortleaf pine and shortleaf pine – mixed hardwood restoration concurrent with reduction of off-site white pine and removal of white pine plantations.
- HW-GLS-03** Increasing size and frequency of prescribed fire within the shortleaf pine and pine oak heath communities along Hiwassee Lake and the Valley River Valley.

- HW-GLS-04** Enhancing high-quality habitat including woodland and young forest conditions for low elevation forest plant and wildlife communities, especially along Hiwassee Lake.
- HW-GLS-05** Restore and maintain woodland conditions across dry-mesic oak, mesic oak, and dry oak heath ecozones.

#### **Providing clean and abundant water**

- HW-GLS-06** If the area is known to include outcroppings of acid-producing geological formations, utilize best management practices to minimize acidification of surface waters when ground disturbing activities are necessary in acid rock areas to achieve forest management goals.
- HW-GLS-07** Enhance habitat for the sicklefin redhorse where marginal habitat exists.
- HW-GLS-08** In the geographic area, there is one 6th level watershed identified as an area where the Forest Service will focus resources to improve watershed conditions and function.

#### **Connecting people to the land**

- HW-GLS-09** Respond to demand for a variety of outdoor recreation experiences by continuing to provide a mix of land-based and water-based recreation activities.
- HW-GLS-10** Along the shoreline of Chatuge and Hiwassee reservoirs, emphasize public access points that sustain the scenic integrity and recreation experience.
- HW-GLS-11** National Forest lands adjoining Apalachia lake are managed to retain the scenic attributes of the lake and undeveloped shoreline.
- HW-GLS-12** Respond to demand for sport shooting by providing opportunities for rifle and pistol shooting in a safe, secure, and sustainable location.
- HW-GLS-13** Respond to demand for hunting opportunities for wild turkey, white-tailed deer, and black bear by maintaining and enhancing habitat, both alone and in partnership with the North Carolina Wildlife Resources Commission.

#### **Places within the geographic area that will be managed in consideration of their unique features**

- HW-GLS-14** The Trail of Tears National Historic Trail and Unicoi Turnpike are both listed on the National Register of Historic Places and are Native American Traditional Cultural Properties managed in consultation with tribes and the National Park Service for preservation, protection, restoration, and interpretation – see the Heritage Corridor Management Area.
- HW-GLS-15** Utilize seed production resources at Beech Creek Seed Orchard and continue to enhance its ability to contribute to future restoration efforts across the Southern Appalachians.

#### **Partnering with others**

- HW-GLS-16** Continue partnership with North Carolina Wildlife Resources Commission for boat access, wildlife habitat management, and improvements to the Panther Top Shooting Range.
- HW-GLS-17** Continue partnering with the TVA on lake projects.



- HW-GLS-18** Continue partnerships with mountain bike groups and hiking trail associations to maintain and improve area trails.
- HW-GLS-19** Partner with tribes and the National Park Service to manage the Trail of Tears and Unicoi Turnpike corridor and restore traditional plant species important for tribal arts and culture.
- HW-GLS-20** Continue partnership with Sicklefin Redhorse Conservation Committee to meet clean and abundant water goals.

## Unicoi Mountains Geographic Area

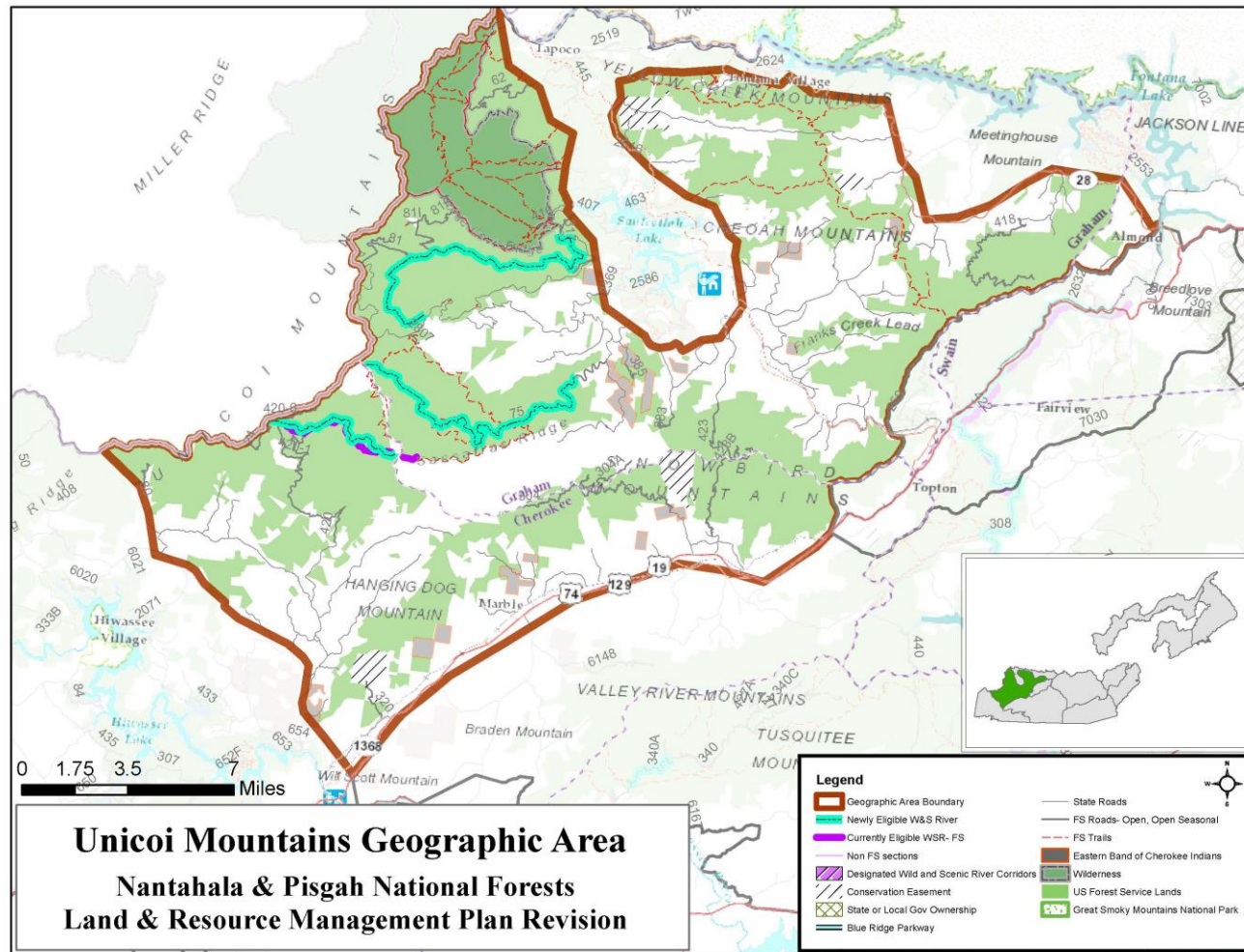


Figure 15. Unicoi Mountains Geographic Area

## Description of area

Located at the western edge of the Nantahala National Forest on the border of North Carolina and Tennessee, the Unicoi Mountains Geographic Area stretches from the Unicoi Mountains in the west through the Snowbird Mountains to the edge of the Nantahala Gorge in the east. This area of western North Carolina contains dozens of creeks, miles of rugged wilderness, and preserved stands of old growth cove forest including the woods of the Joyce Kilmer Memorial Forest. With a national scenic byway traversing the region, diverse types of visitors can appreciate the region's stretches of forested mountainsides and deep narrow valleys.

Prior to European and Anglo-American settlement and westward expansion, the Unicoi Mountains Geographic Area was home to the Cherokee and Creek Tribes. This area contains several landscape features that figure most prominently in tribal history and have significant meaning to tribal identities and beliefs. These locations are important traditional and ceremonial areas for the Cherokee.

The waters of the Unicoi Mountains drain into the Tellico River and Cheoah River, which are tributaries of the Little Tennessee River, and, at the southern end of the geographic area, into the Valley River, which is a tributary of the Hiwassee River. The many creeks, including Santeetlah and Snowbird Creeks on the slopes of the two mountain ranges, flow east into the Santeetlah Lake basin. The steep descents of the region's geography create numerous waterfalls and rapids that make the area a popular spot for hiking, trout fishing, and hunting. The area has experienced significant improvements in scenic visibility with reduced air pollution in the region. Air quality is likely to continue to improve toward the goal of natural background visibility by 2064.

Communities within this geographic area include the Snowbird Cherokee Community, Robbinsville, Stecoah, and Andrews. These communities and others nearby rely on the 119,802 acres of forest land in the geographic area (225,031 acres total). The region is within the Cheoah and Tusquee Ranger Districts. National Forest System lands within this area lie in Graham and Cherokee counties.

Management areas within the geographic area include:

- Joyce Kilmer-Slick Rock Wilderness (a federal mandated Class I area)
- The Joyce Kilmer Memorial Forest botanical/zoological/scenic area and Santeetlah Creek Bluffs botanical area
- Appalachian National Scenic Trail Corridor
- Cherokeah Skyway National Scenic Byway
- Trail of Tears National Historic Trail
- Snowbird Wilderness Study Area
- Snowbird Creek and Tellico River, portions of which are eligible Wild and Scenic Rivers; and Santeetlah Creek, portions of which are a newly eligible Wild and Scenic River
- Inventoried Roadless Areas

## Connecting people to the land

Cherokee and Creek traditions and culture are showcased in archeological sites in the forest. The Trail of Tears National Historic Trail recognizes the forced removal of the Cherokee and Creek people from the region in 1838. The trail is managed by the Forest Service in consultation and partnership with the Cherokee Tribes in North Carolina and Oklahoma and Creek Tribes in Oklahoma, Alabama, Louisiana, and Texas. There are seven Cherokee towns located within this geographic area: Tomotla, Neowee, Conoste, Tulula, Little Tellico, Nantahala, and Nottely. This geographic area contains 130 miles of pre-contact and early historic routes, 30.5 miles of which are on the Nantahala National Forest.

During the 19th century, the region was home to several logging and hunting communities with their presence preserved in several spots in the forest including the 19th century Stewart Cabin near Santeetlah Creek. The geographic area also includes the Junaluska Museum in Robbinsville.

The modern Cherokee Snowbird Community makes its home in the Snowbird Mountains. This community preserves traditional Cherokee lifeways and makes use of the forest to meet cultural needs.

This geographic area provides solitude sought by hikers and backpackers seeking to find challenging trails as well as the streams of Joyce Kilmer-Slickrock Wilderness and Snowbird Wilderness Study Area. Local and out-of-state visitors also enjoy Poplar Cove in Joyce Kilmer Memorial Forest which is a destination for tourists to the Southern Appalachian region. The Cherohala Skyway, connecting Tellico Plains, TN with Robbinsville, NC, draws many thousands of visitors each year to the natural beauty of the Nantahala and Cherokee National Forest's Unicoi Mountains serving as a scenic backdrop. Rattler Ford Group Camp and Horse Cove Campground provide developed camping for groups, Wilderness visitors, and anglers. Additionally, just outside the Wilderness boundary sits the primitive Swan Cabin which can be reserved for overnight stays. Long-distance hikers enjoy the Benton MacKaye Trail which passes through Joyce Kilmer-Slickrock Wilderness and the Bartram National Recreation Trail and Appalachian National Scenic Trail, both of which traverse Cheoah Bald roadless area.

The undeveloped character of many locations within the geographic area provides undisturbed habitats with abundant populations of game and non-game wildlife which is popular with hunters and bird watchers. The Forest Service maintains a shooting range at Atoah and dispersed camping along Santeetlah Creek and Snowbird Creek, which are frequently utilized by hunters and anglers.

Forest products and tourism are economic drivers for the local communities. National Forest System lands provide a wide variety of opportunities in support of both. Additionally, the geographic area is popular for commercial and personal medicinal herb collection as well as ramp collection. The area is important for collection of traditional plants.

### **Sustaining healthy ecosystems**

The geographic area contains some of the region's best examples of old growth cove and mesic and dry mesic oak temperate forests. This geographic area also includes highly impacted eastern hemlock stands, particularly in the Santeetlah Creek watershed. The loss of eastern hemlock in northern hardwood forest potentially impacts long-term conifer cover for the endangered Carolina northern flying squirrel as well as habitat for range-limited and rare species such as the Junaluska salamander, golden-winged, and cerulean warblers. The geographic area also contains several unique geological features such as Santeetlah Bluffs.

Rare habitats within the geographic area include boulderfields, heath balds, seeps, and montane cliffs. High elevation openings along the Cherohala Skyway have created grass-dominated balds since they were created over 100 years ago. All these habitats support numerous plant and lichen SCC.

### **Clean and abundant water**

High mountain seeps and springs feed the public water supply for Robbinsville and Andrews. Many streams and the Tellico River provide habitat for trout, making it a prime destination for fly fishing before they feed into the Tennessee Valley Authority reservoirs at Santeetlah and Fontana Lakes in the Fontana Lake Geographic Area.

Approximately 600 miles of creeks and rivers run through the geographic area on National Forest System lands. Streams within this area provide habitat for numerous populations of native brook trout and the eastern hellbender.

The geographic area contains geology with high concentrations of sulfide minerals. When exposed by excavation or landslides, these acid-producing rocks can degrade water quality in the immediate area and downstream via runoff or if the rocks are used in embankments or stockpiled in waste areas.

Priority watersheds for the Geographic Area include: Yellow Creek-Cheoah River; Santeetlah Creek; and Lower and Upper Fontana Lake-Little Tennessee River.

## Goals

The following goals contribute to identification of management priorities in the Unicoi Mountains Geographic Area. These goals highlight key opportunities and values that will guide Forest Service management and reflect values the Forest Service has heard from the public. These goals are not inclusive of all activities that will occur within the geographic area and do not represent all the values that are present.

### Sustaining healthy ecosystems

- UM-GLS-01** Focus restoration efforts on increasing the breeding and foraging habitat for golden-winged warblers.
- UM-GLS-02** Increase variable size openings in rich cove, mesic oak, northern hardwoods, and high elevation red oak forests to restore natural range of variation, including providing habitat for golden-winged warblers and cerulean warblers within their respective priority areas.
- UM-GLS-03** Enhance, restore, and augment native ginseng populations. Manage permitted collection of American ginseng at sustainable levels.
- UM-GLS-04** Maintaining and increasing the Carolina northern flying squirrel population through active restoration and habitat enhancement and planting red spruce in northern hardwood forests within the headwaters of Santeetlah creek and along the Cherohala skyway.
- UM-GLS-05** Maintain and restore historic balds.

### Providing clean and abundant water

- UM-GLS-06** Maintain water quality in the watersheds that supply water to Andrews and Robbinsville.
- UM-GLS-07** Enhance native brook trout where habitat is suitable.
- UM-GLS-08** Enhance populations of sicklefin redhorse where habitat is suitable.
- UM-GLS-09** Minimize acidification of surface waters due to disturbance of acid-producing geological formations.
- UM-GLS-10** There are four 6th level priority watersheds targeted for restoration efforts within this geographical area.

### Connecting people to the land

- UM-GLS-11** Manage and restore traditional plant species important both for tribal arts and culture and for local communities, including food and medicinal plants, where possible and practical.

- UM-GLS-12**     Contribute to the economic vitality of the area’s forest products industry by meeting forest health and restoration goals.
- UM-GLS-13**     Respond to demand for a variety of outdoor recreation experiences by continuing to provide developed camping, dispersed camping, and day use sites with an emphasis on sites supporting tourism and access to regional and national attractions such as the Cherohala Skyway, Appalachian Trail, Joyce Kilmer-Slickrock Wilderness, and Snowbird Backcountry area.
- UM-GLS-14**     Maintain hike-only trail systems in Wilderness and Backcountry areas and continue to provide horseback riding in areas with concentrations of gated NFS roads to augment riding opportunities for equestrian groups and wagon trains.
- UM-GLS-15**     Respond to demand for hunting opportunities for ruffed grouse, wild turkey, white tailed deer, and black bear by maintaining and enhancing habitat, both alone and in partnership with the North Carolina Wildlife Resources Commission.

**Places within the area that will be managed in consideration of their unique features**

- UM-GLS-16**     Appalachian Trail and Bartram Trail for their nationally recognized values.
- UM-GLS-17**     The Trail of Tears National Historic Trail is listed on the National Register of Historic Places and is a Native American Traditional Cultural Property managed in consultation with tribes and the National Park Service for its preservation, protection, restoration, and interpretation – see the Heritage Corridor Management Area.
- UM-GLS-18**     Cherohala Skyway and its many scenic vistas for its nationally recognized values.
- UM-GLS-19**     Joyce Kilmer Memorial Forest for forest health and public enjoyment of the old growth poplar grove.
- UM-GLS-20**     Cheoah Bald, Bob Bald, Hooper's Bald, and other high-elevation heath and grass balds for their historic and botanical significance.
- UM-GLS-21**     Santeetlah Bluffs for continued management to conserve old growth characteristics.

**Partnering with others**

- UM-GLS-22**     Continue partnership with trail associations on the Appalachian Trail, Bartram Trail, and Benton MacKaye Trail for improvement and maintenance of these long-distance trails.
- UM-GLS-23**     Continue partnerships with trail clubs, friends groups, outdoor recreation groups, and wilderness advocacy groups to help manage the hike-only trail systems, and manage, maintain, or enhance wilderness character in wilderness and wilderness study areas, including Joyce Kilmer-Slick Rock Wilderness, as well as educating visitors about wilderness values and ethics.
- UM-GLS-24**     Partner with Cherokee National Forest and N.C. Department of Transportation in ongoing maintenance of the Cherohala Skyway and its day-use sites and vista openings.
- UM-GLS-25**     Work with the Southern Research Station, universities, and others to facilitate biological and social research tied to Joyce Kilmer-Slickrock Wilderness.
- UM-GLS-26**     Partner with Cherokee and Creek Tribes and the National Park Service to manage the Trail of Tears corridor.

- UM-GLS-27** Partner with Snowbird Cherokee to manage and restore traditional plant species important for tribal traditions, culture and arts.
- UM-GLS-28** Partner with Junaluska Museum to implement Cherokee Tribal interpretation as appropriate.
- UM-GLS-29** Continue partnership with the North Carolina Wildlife Resources Commission to maintain and improve the wildlife openings in the geographic area and to maintain and improve the Atoah Shooting Range.
- UM-GLS-30** Expand opportunities with the NCWRC for native brook trout distribution enhancement.
- UM-GLS-31** Work with local government and tourism organizations to support additional access in winter months to extend the recreation season.

## Chapter 4: Management Areas

### What is a management area?

While the majority of forest plan direction is contained in the Forestwide chapter (Chapter 2), there are areas of the forest that have similar management intent and a common management strategy. These areas are known as management areas.

Management areas (MA's) ensure consistent approaches to achieving desired conditions and objectives among the multiple ranger districts who will administer this plan. Most of the management areas are not spatially contiguous but instead are distributed among the 12 geographic areas that divide the forest (described in Chapter 3: Geographic Areas). Each management area emphasizes different aspects of the vision established in the forest plan themes and forestwide desired conditions. A distinct set of plan components for each management area provides for its unique emphases.

Management area direction builds on the direction that is provided in Chapter 2 (Forestwide direction). Chapter 4 does not substitute for or repeat Chapter 2 direction. In the event that direction in this chapter and direction in another section conflict, a project or activity level evaluation may be required to resolve the conflict; generally, the more restrictive plan decision prevails. If management area direction does not address a particular topic, that is because that topic is addressed in Chapter 2 and does not vary by management area.

Throughout this chapter plan components (plan decisions) are displayed with coded bullets. Text that does not contain a code does not constitute a plan decision. Rather, it is background material, more detailed explanation, or a description of management approaches.

### What are the management areas on the Nantahala and Pisgah National Forest?

There are five general forest management areas: Interface, Matrix, Backcountry, Ecological Interest Areas, and Administrative Sites. The Backcountry management area includes but is not limited to Inventoried Roadless Area lands.

The remaining management areas are allocated on the basis of unique or special characteristics including: Research Natural Areas, Experimental Forests, Appalachian National Scenic Trail Corridor, National Scenic Byways, Heritage Corridors, Wild and Scenic River Corridors, Congressionally Designated Wilderness, Recommended Wilderness and Wilderness Study Areas, forest identified Special Interest Areas, Roan Mountain, and the Cradle of Forestry in America.

### How were management areas determined?

The concept and spatial arrangement of the general forest management areas of Interface, Matrix, and Backcountry were derived by considering landscape ecology and human use of the land. Landscape ecology considerations include the overall landscape structure and function, the spatial pattern of landscape elements, and the movement and flows of animals (including humans), plants, water, wind, materials, and energy through the structure. Management allocation also considered the benefits the forest provides to people - personal, social, economic, and environmental. These management areas consider the recreation settings, activities, and opportunities for experiences and the scenic conditions across the landscape, as well as the primary ways that the forest is accessed.

The interdisciplinary team and district specialists made adjustments to management area locations based on information provided during public input, including comments received by mail and public meetings, and information from meetings with agencies of state and local governments, and Native American tribes. Forest Service personnel collaborated with people representing a full spectrum of



interests to derive the spatial arrangement of the management areas, and iterative adjustments have been made in developing this framework.

### How do management areas work together?

When viewed as a complete forest landscape, these management areas work together to form a network of patches, edges, corridors, and mosaics. A patch exhibits consistent characteristics across a specific land area, but varies by size, number, and shape. Edges are outer portions of patches, where environments differ from the inside of the patches. Corridors are structures that provide connectivity, such as roads or stream and river corridors used by humans and wildlife. Mosaics are patches of various sizes and shapes formed by a combination of networks and disturbance. The combination of these areas provides for the forest's diversity of habitats, further described in the Landscape Pattern and Connectivity section in Chapter

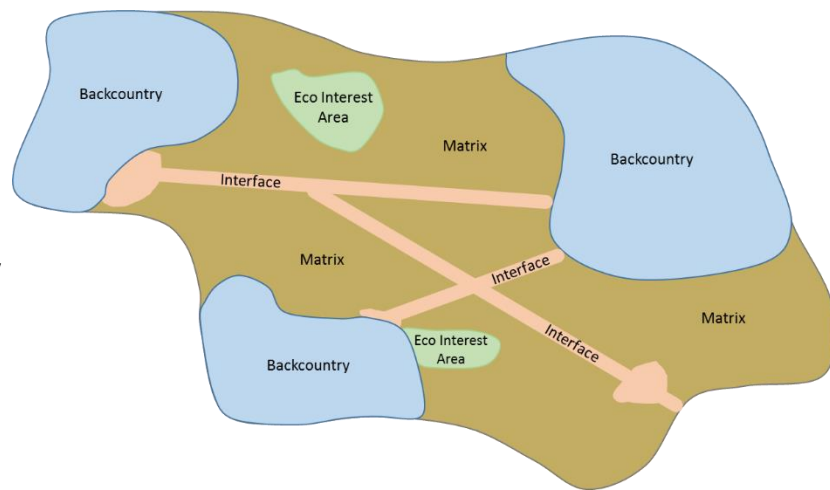
2.

In this plan, the Matrix is the largest management area of the forest, serving as the most generalized forest management area and connecting the other management areas in a generally undeveloped national forest landscape. Large scale patches include management areas Backcountry, Wilderness, and Roan Mountain. Generally smaller patches include

Ecological Interest Areas, Special Interest Areas, Research Natural

Areas, Experimental Forests, and the Cradle of Forestry in America. Corridors include Interface, Heritage Corridors, the Appalachian National Scenic Trail Corridor, and Wild and Scenic River corridors.

Administrative sites are small, and at a landscape scale, merge into the mosaic of the surrounding forest. Each of these management areas is managed to provide different ecological and social benefits, further described below for each area.



**Figure 16. Conceptual representation of Interface, Matrix, Ecological Interest Area**

## Management Area: Interface

### Background

This management area contains the most concentrated recreation use on the forest, including developed and dispersed recreation locations, as well as National Recreation Trails and some heavily used roads that bring visitors to these locations. Interface provides both corridors and distinct locations where the public either travels through or specifically recreates. As such, this management area becomes the interface by which most forest visitors begin their interaction with the National Forest. Here, visitors have easy access to a variety of forest activities, including visitor facilities, and access to some trailheads that make hiking, biking, horseback riding, climbing, hunting, and gathering possible. This management area also includes all off highway vehicle trail systems, and the developed areas surrounding reservoirs. While recreation on the forest is not confined to this management area, use is concentrated in these areas because of recreation infrastructure. Recreation opportunities and settings in the Interface emphasize experiences that consider the comfort and convenience of visitors more than in other management areas.

Management activities, such as invasive species management, mechanical timber harvest, and prescribed fire, are conducted in Interface to support healthy ecosystems and wildlife habitats. Visitors will see the results of forest management practices, including temporary or permanent road access points; vegetation treatments, including various harvest practices; forest stand improvement treatments; pest control; or the results of prescribed fires. The design of these management activities considers high concentration of forest users and accounts for heavier public use. Interpretation of management activities is emphasized here to provide information to the public about forest management.

The following are National Recreation Trails on the Forests within this management area. These trails were identified by the Secretary of Agriculture or Interior for their recreation unique values which are described in more detail in the associated geographic area.

**Table 10. National Recreation Trails Within the Interface Management Area**

Trail Name	Miles	Geographic Area(s)
Andy Cove	0.7	Pisgah Ledge
Art Loeb	31	Pisgah Ledge, North Slope
Bartram	78.4	Nantahala Mountains, Nantahala Gorge, Fontana Lake, Unicoi Mountains
Biltmore Campus	1	Pisgah Ledge
Joyce Kilmer Memorial Loop	2	Unicoi Mountains
Mountains-to-Sea	169	Great Balsam, North Slope, Pisgah Ledge, Black Mountains, Eastern Escarpment
Roan Mountain Gardens	1.5	Bald Mountains
Shut-In	16.3	Pisgah Ledge
Whiteside Mountain	2	Highland Domes

This management area includes two forest scenic byways, the Mountain Waters Scenic Byway, and the western fork of the Forest Heritage Scenic Byway, that are recognized by the Forest Service for their outstanding recreational and scenic opportunity.<sup>28</sup>

## **Recreation**

### **Desired Conditions**

- INT-DC-01** Visitors are able to choose from a wide variety of recreation opportunities in high quality, well maintained developed or dispersed settings that range from rural and roaded natural at highly developed recreation sites, roaded natural along and around roadways, to semi-primitive motorized and semi-primitive non-motorized where adjacent to Backcountry or other remote areas.
- INT-DC-02** Recreation use is generally higher in Interface than other management areas, although that high use may not occur on every location. Dispersed recreation opportunities may offer lower concentrations of use, such as National Recreation Trails. Developed recreation experiences emphasize visitor safety, user comfort and convenience, and increased accessibility for visitors with disabilities.
- INT-DC-03** Main access corridors and contact points such as developed trailheads and observation points have high-quality visitor information available to enhance visitor safety and experiences and to provide a transition and orientation place for visitors as they enter the forests.
- INT-DC-04** National Recreation Trails provide outstanding recreational experiences consistent with the unique values that have been recognized for each trail, described further in the respective geographic areas that each trail crosses.
- INT-DC-05** National Forest scenic byways connect the public to destinations and special places, providing an opportunity to explore the beauty, history, and heritage of the forest, while increasing public awareness and understanding forest management.
- INT-DC-06** Off Highway Vehicle (OHV) trail systems are managed to provide a variety of motorized recreation opportunities on identified routes in natural appearing settings. Routes are well maintained, and trail improvements or relocations focus on mitigating impacts to environmental and cultural resources while providing for user satisfaction. Trail difficulty levels vary to accommodate a variety of desires and abilities.

### **Standards**

- INT-S-01** Within motorized trail systems, ATVs, side-by-sides, UTVs, and motorcycles are restricted to trails specifically designated as open to such vehicles.

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<sup>28</sup> Note that forest scenic byways included in this management area are just part of a broader byways system. National Scenic Byways and All-American Roads, which are recognized by the Federal Highway Administration, including the Blue Ridge Parkway, the Cherokeela Skyway, and a portion of the Forest Heritage Scenic Byway, all have plan direction found in the Scenic Byways Management Area. NC State Scenic Byways also traverse the forest across multiple management areas.

## Management Approaches

When implementing decisions for sustainable recreation, consider the geographic area goals for connecting people to the land.

Improving or expanding existing OHV trails is given priority consideration over designating new OHV trail systems, and expansion of existing OHV trails are for resource protection or user safety.

## Transportation and Access

### Desired Conditions

- INT-DC-07** Safe primary passenger car access in these areas is retained.
- INT-DC-08** Shoreline access along reservoirs provides safe access for anglers and boaters and supports and encourages local tourism.
- INT-DC-09** Designated off-highway vehicular areas support motorized recreational use.

### Standards

- INT-S-02** Changes to the road management objective or maintenance level of any system road accessing a recreation area shall not restrict or limit access to the recreation area.
- INT-S-03** Seasonally restricted roads may be open for short timeframes for specific purposes, such as hunting, berry picking, or seasonal foliage viewing, when impacts to natural resources can be prevented or mitigated.

## Scenery

### Desired Conditions

- INT-DC-10** Desired scenic character is natural-appearing or pastoral in semi-primitive recreation settings; and rural forested, pastoral, or cultural/historic in roaded natural or rural settings.
- INT-DC-11** Proposed actions are designed to meet or exceed the following desired SIOs on lands inventoried as the corresponding scenic classes:

#### Interface Management Area

Inventoried Scenic Class	Desired Scenic Integrity Objective
1	High
2	Moderate
3	Moderate
4	Low
5-7	Low

## **Cultural Resources, and Tribal Resources**

### **Management Approach**

Emphasize cultural resources and tribal history interpretation in this area more than in Matrix or Backcountry, and use Native American languages in interpretation and consultation with tribes.

### **Vegetation Management**

#### **Desired Conditions**

- INT-DC-12** As a result of the potential interaction between visitor use and forest management in the Interface, vegetation treatments, though primarily designed for restoration, emphasize recreation, aesthetic, and scenic values in project development.
- INT-DC-13** Given the heavy concentrated use in this area, interpretation of vegetation management activities is emphasized here with an education focus on sustainable forestry principles, forest health, wildlife habitat, and long term expected outcomes from activities.

#### **Standard**

- INT-S-04** Vegetation treatments within Interface shall not detract long-term from visitor experiences (such as recreation, access, and scenery), as determined by project resource analysis. Where possible, design treatments to be compatible with or enhance the visitor experience.

### **Management Approach**

Management activities will be designed to limit visual impacts to forest users through scenery mitigation techniques such as increased, irregular edge design, re-contouring, and advanced closure techniques for temporary roads, etc. Generally, the effects of timber harvest will be mitigated most heavily just next to the road or site and decreasing the intensity as the treatments move further from the recreation.

Vegetation treatments can be expected within or directly adjacent to recreation sites or trailheads. For example, the intent may be to reduce hazard trees or to provide open stand conditions for wildlife and opportunities for grasses, flowering plants, and trees that improve site distance.

Vegetation management techniques in this area may include creating vistas, meadows, woodlands, or pastoral landscapes that enhance recreation or wildlife viewing opportunities. Openings can be developed, or existing openings improved or enlarged, to increase sight distance and to enhance wildlife habitat to improve viewing opportunities for wildlife.

In developed recreation sites, refer to the management approaches for vegetation management in forestwide developed recreation.

## **Wildlife**

### **Desired Conditions**

- INT-DC-14** All wildlife habitat types discussed in the forestwide desired conditions are found in Interface; however, open habitats such as grassy or shrubby openings and woodlands may be more frequent in this management area in order to enhance wildlife viewing opportunities and aesthetic experience.

- INT-DC-15** Existing permanent wildlife openings are sustained or enhanced, and new ones are created where needed to support healthy wildlife populations.
- INT-DC-16** Wildlife features, including wildlife habitat and species diversity, such as permanent grass forb openings and permanent and temporary openings in the canopy, are most heavily interpreted in this management area.

## **Forest Health**

### **Management Approach**

In order to meet the Forestwide objective, and given the high use by the public in Interface, and therefore the increased likelihood of non-native invasive species infestations and other forest health threats, prioritize education, control, early detection, rapid response, and monitoring. These actions should occur more frequently in Interface than in other management areas.

Removal of hazard trees will be higher in Interface compared to other management areas given the higher public use that that occurs.

As pests or diseases occur within this management area, consultation with forest health experts (state and private forestry or NC state forest health professionals) should occur promptly.

## Management Area: Matrix

### Background

Matrix is the largest management area in the Forests and functions as large patch landscape providing connections between Interface, Backcountry, and other special designations. The Matrix provides open, edge, and interior wildlife habitat with a diversity of sizes and shapes, as well as providing multiple uses sustained by lower levels of motorized and non-motorized access, in comparison to Interface.

Matrix is comprised of diverse vegetation, ranging from young forest to old growth and includes stream and river corridors, unique habitats, and common communities. Within Matrix, active restoration activities augment natural disturbance to provide greater resiliency, by enhancing composition, structure, function, or connectivity. Since this management area emphasizes active management to achieve desired conditions for healthy ecosystems and wildlife populations, visitors can expect to see ongoing, recent, or past management, including mechanical timber harvest, and prescribed fire, and how these activities contribute to forest resiliency.

The Matrix also contains smaller isolated patches of National Forest land surrounded by private ownerships. These patches contribute to maintaining a broader forested landscape in conjunction with adjacent landowners.

Recreational opportunities emphasize moderately secluded habitats for hiking, biking, horseback riding, hunting, fishing, and watersports. Interactions with other visitors are of low to moderate frequency.

### Vegetation Management

#### Desired Conditions

- MAT-DC-01** The Matrix includes diverse vegetation conditions ranging from young forest to old growth forest, including both dense and open park-like conditions. Development of the variety of habitats and successional states are the result of management to meet objectives of restoration, wildlife habitat, and sustainable flow of wood products.
- MAT-DC-02** Young forests, across all ecozones, occur at a higher frequency in Matrix compared to other management areas. Locally, young forest patch size will frequently exceed average natural disturbance gap size to provide for habitat diversity and benefit wildlife, and to facilitate restoration operations and financial considerations, but will not contribute to exceeding the Natural Range of Variation at the landscape scale.

### Wildlife

#### Desired Conditions

- MAT-DC-03** Young forest habitat occurs in greater proportions in Matrix than other management areas, providing proportionally more edge habitats that provide early seral conditions, and supporting species (such as bats, pollinators, ruffed grouse, and golden-winged warblers) that depend on grass and shrub habitat and soft mast.
- MAT-DC-04** Existing wildlife fields, linear wildlife habitats, old fields, balds, and other permanently open wildlife habitats are sustained. Some of these permanent openings may provide more shrub/sapling habitat as a result of longer maintenance cycles.

- MAT-DC-05** New and expanded wildlife fields, linear wildlife openings, and some closed roads are daylighted, seeded, and maintained as linear wildlife openings for purposes of enhancing brushy interface and young forest conditions.

## Forest Health

### Desired Condition

- MAT-DC-06** To protect restoration, habitat, and sustainable forest product objectives, forest pests and other health threats are addressed as soon as practicable using the most effective treatments on a scale commensurate with available funding and resources.

## Transportation and Access

### Desired Conditions

- MAT-DC-07** Roads in the Matrix provide the public varying levels of access, both motorized and non-motorized, to areas of the Forests that are less frequently visited than those in Interface. Access in this management area is retained or restored for emergency access, fire breaks, and traditional uses, such as hunting, fishing, and gathering, as well as for future active restoration and forest health needs, including timber harvest.
- MAT-DC-08** Service on NFS roads ranges from basic custodial care (ML 1) to paved roads offering high degree of user comfort and convenience (ML 5). Some roads in this area may be suitable for passenger cars, although comfort and convenience are not emphasized, and these roads are intended for travel at low speeds with single lanes and turnouts (ML 3). Roads are maintained to protect water quality and prevent erosion.
- MAT-DC-09** Closed roads could be open seasonally for short timeframes for specific purposes, such as hunting, berry picking, or seasonal foliage viewing.

## Recreation

### Desired Conditions

- MAT-DC-10** A variety of dispersed recreation opportunities are provided in settings that range from semi-primitive motorized, to rural and roaded natural.
- MAT-DC-11** Developed facilities are generally limited and primarily provide for health, sanitation, and resource protection. Developed recreation sites are designed with rudimentary or rustic improvements at lower development levels.
- MAT-DC-12** Non-motorized trail opportunities exist across the area and are designed for high quality user experiences and resource protection. Trail classes range from 1 (minimally developed) to 5 (highly developed) with features and structures consistent with appropriate recreation settings.

## Scenery

### Desired Conditions

- MAT-DC-13** Desired scenic character is natural-appearing or pastoral in semi-primitive motorized recreation setting, and rural forested, pastoral, or cultural/historic in roaded natural or rural settings.



- MAT-DC-14** Proposed actions are designed to meet or exceed the following desired SIOs on lands inventoried as the corresponding scenic classes:

**Matrix Management Area**

Inventoried Scenic Class	Desired Scenic Integrity Objective
1	High
2	Moderate
3	Low
4	Low
5-7	Low

## Management Area: Backcountry

The Backcountry management area contains large blocks of remote and unroaded forest primarily shaped by natural processes, except where active management is utilized to restore ecosystem composition, structure, function, and to provide resiliency against insects and disease. Sections of the Forests within this management area are generally 2,500 acres or greater in size; however, some areas may be smaller if they are adjacent to other Semi-primitive Non-motorized management. These areas are primarily shaped by natural processes such as floods, storms, insects, diseases, and fires. Fire is present on the landscape and is managed to benefit natural resources and reach desired conditions. Needed existing system roads are maintained, but new road construction and reconstruction are limited. Unneeded system roads are prioritized for decommissioning, while unauthorized roads are prioritized for obliteration.

The landscape features predominantly mid-and late-successional forest communities as well as old growth with a continuous forested canopy that changes in density based on ecozone desired conditions. The Backcountry management area emphasizes habitat for species that thrive in large blocks of older forests. Forest management that enhances or restores community composition and structure may occur in this management area to accomplish site-specific restoration goals, although the cutting, sale, or removal of timber in these areas is expected to be infrequent.

These areas provide large tracts of Backcountry recreation opportunities, emphasizing a Semi-primitive Non-motorized setting with limited recreational facilities. Hiking, backpacking, mountain bike riding, horseback riding, climbing, nature study, hunting, fishing, boating, and watersports are typical activities that may be available in a setting where freedom from the sights and sounds of modern civilization is important. Backcountry recreationists may notice ecological restoration management, maintenance of existing wildlife openings, and occasional prescribed fire or fire lines in these areas.

Part of this management area includes Inventoried Roadless Areas (IRAs) governed by the Roadless Area Conservation Rule that are not within Wilderness Study Areas, or areas recommended for Wilderness, and these areas have additional management guidance specified below. These IRAs were identified in the national 2001 Roadless Area Conservation Rule, which prohibits road construction and reconstruction in IRAs (apart from a few exceptions) and outlines their Roadless Area characteristics. IRAs are characterized as having an undeveloped character and are valued for many resource benefits including wildlife habitat, biological diversity, and dispersed recreation opportunities. Restoration activities in IRAs will have different management guidance, as specified below, consistent with national policy.

Plan components listed below apply to the whole Backcountry management area unless a plan component is specified as only applying to the Inventoried Roadless Area portions of this management area or those portions of the management area outside IRAs.

## Vegetation Management

### Desired Conditions

- BAC-DC-01** Large blocks of remote and unroaded forest appear to be primarily shaped by natural processes, where old growth characteristics develop and dominate large parts of these areas over time.
- BAC-DC-02** Mid- to late-successional communities and old growth forests predominate, providing a contiguous forest canopy (that changes in density or openness based on ecozone desired conditions) across most of the management area. Patches of young forest and

canopy gaps, generally smaller in size when compared to Interface and Matrix, trend towards an amount and distribution described in the ecozone desired conditions.

## Standards

- BAC-S-01** These lands are unsuitable for timber production.
- BAC-S-02** **Within Inventoried Roadless Areas** lands are not suitable for timber production. Timber may not be cut, sold, or removed except when the cutting, sale, or removal of generally small diameter timber is needed for one of the following purposes and will maintain or improve one or more of the Roadless Area characteristics. Follow the latest Forest Service policy regarding delegation of approval for the following activities:
- To improve threatened, endangered, or proposed species habitat;
  - To maintain or restore the characteristics of ecosystem composition and structure;
  - The cutting, sale, or removal of timber is incidental to the implementation of a management activity not otherwise prohibited;
  - The cutting, sale, or removal of timber is needed and appropriate for personal or administrative use.
- BAC-S-03** **Outside of Inventoried Roadless Areas**, in order to retain Backcountry character, the cutting, sale, or removal of timber must meet the same purposes as within IRAs; however, there is not a diameter size restriction.

## Wildlife

Across the Backcountry management area (both outside and within Inventoried Roadless Areas):

### Desired Conditions

- BAC-DC-03** Wildlife habitat conditions in Backcountry reflect larger contiguous blocks, core and interior forest conditions and proportionally more old growth forest conditions than Interface and Matrix.
- BAC-DC-04** Wildlife habitat conditions support rare species and game species (such as veery, hermit thrush, Swainson's thrush, wood thrush, cerulean warbler, Kentucky warblers, salamanders, and black bear) that respond to larger blocks of older forest.
- BAC-DC-05** Existing wildlife fields and linear wildlife habitats are sustained. Some of these permanent openings may provide more shrub/sapling habitat as a result of longer maintenance cycles.

## Standards

- BAC-S-04** Creation of brushy interface adjacent to or expansion of existing wildlife fields and linear wildlife openings will not exceed 100 feet in any direction or a doubling of the current opening size, whichever is smaller.
- BAC-S-05** Construction of new permanent wildlife fields and linear wildlife habitats is not permitted, however conversion of existing unneeded roads that would otherwise be decommissioned can be converted to linear wildlife habitats.

## Forest Health

### Guideline

- BAC-G-01** Allow control of insect and disease outbreaks when necessary to reduce hazards to visitors, for safety, or to protect scenic and recreational values with consideration of protection of adjacent lands. When actions are needed, first consider integrated pest management, such as biological controls, then hand-control methods, and finally pesticides. Consider the most effective and least ecologically disruptive technique that will accomplish control of the pest while considering the type and intensity of the outbreak. Also consider the role of native pests as natural disturbance processes that are consistent with NRV.

## Fire

### Desired Conditions

- BAC-DC-06** Fire in these large, forested landscapes plays an important role to maintain or restore fire-associated forested communities, to improve forest structure, and to reduce fuel buildups.
- BAC-DC-07** Fire suppression alternatives will be based on values at risk, such as firefighter and public safety, infrastructure, and neighboring lands.
- BAC-DC-08** Where fire does not pose threats to values at risk and is naturally occurring, then fires may burn at higher intensity and extent than would be found in Interface or Matrix. As a result there may be larger acreages that exhibit fire effects in Backcountry than would be found in other management areas.
- BAC-DC-09** Prescribed fire and natural ignitions are managed to reduce high fuel loadings; improve, maintain, and create wildlife habitat; or benefit fire-dependent ecosystems and associated species (such as Table Mountain pine and oak forests).
- BAC-DC-10** Where ignitions are human caused, the values at risk analysis considers a range of suppression options.

### Standards

- BAC-S-06** Allow for fuels reduction needs when necessary to reduce hazards to visitors, wildland urban interface environments, or for safety with consideration of protection of adjacent lands.
- BAC-S-07** Prescribed fire may be used to create openings to support habitat development and early seral and stand replacement forest conditions.

### Guideline

- BAC-G-02** Use natural fuel breaks such as streams, roads, rock slides, etc., where possible, to minimize fireline construction. Emphasize the use of handlines, and minimize dozer lines.

## Transportation and Access

### Desired Condition

- BAC-DC-11** Within Inventoried Roadless Areas, the undeveloped character identified in the 2001 Roadless Area Conservation Rule is retained.

### Standards

- BAC-S-08** Maintenance of existing system roads is permissible.
- BAC-S-09** Across the Backcountry management area (both outside and within Inventoried Roadless Areas) system roads may not be constructed or reconstructed unless one of the following conditions applies. Within Inventoried Roadless Areas, the latest Forest Service policy regarding delegation of approval of these activities must be considered:
- i. A road is needed to protect public health and safety in cases of an imminent threat of flood, fire, or other catastrophic event that, without intervention, would cause the loss of life and/or property;
  - ii. A road is needed to conduct a response action under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, 1980), or the Superfund Amendments and Reauthorization Act (SARA, 1986)), or to conduct a natural resource restoration action under CERCLA, section 311 of the Clean Water Act, or the Oil Pollution Act (1990);
  - iii. A road is needed pursuant to reserved or outstanding rights or as provided for by statute or treaty;
  - iv. Road realignment is needed to prevent irreparable resource damage that arises from the design, location, use, or deterioration of a system road that cannot be mitigated by road maintenance. Road realignment may occur under this paragraph only if the road is deemed essential for public health and safety, public or private access, or natural resource management;
  - v. Road reconstruction is needed to implement a road safety improvement project on a system road determined to be hazardous on the basis of accident experience or accident potential on that road;
  - vi. The appropriate decision-maker determines that a Federal Aid Highway project, authorized pursuant to Title 23 of the United States Code, is in the public interest or is consistent with the purposes for which the land was reserved or acquired and no other reasonable and prudent alternative exists; or
  - vii. A road is needed in conjunction with the continuation, extension, or renewal of a mineral lease on lands that are under lease or for a new lease issued immediately upon expiration of an existing lease. Such road construction or reconstruction must be conducted in a manner that minimizes effects on surface resources, prevents unnecessary or unreasonable surface disturbance, and complies with all applicable lease requirements, land management plan direction, regulations, and laws.
  - viii. Roads constructed or reconstructed pursuant to this paragraph must be obliterated when no longer needed for the purposes of the lease or upon termination or expiration of the lease, whichever is sooner.

- BAC-S-10** Outside of Inventoried Roadless Areas, ecological restoration desired conditions and objectives can be achieved through use of existing roads or construction of temporary roads or equipment trails. These temporary roads and equipment trails must be obliterated, and the remote characteristics of the area must be restored.
- BAC-S-11** Outside of Inventoried Roadless Areas, along roads that form the boundary of Backcountry, the following activities are allowed within 100 feet of the road: minor road relocation; vegetation management for road maintenance and wildlife habitat enhancement; and vegetation management to facilitate project implementation in adjacent management areas, such as cutting of trees for auxiliary facilities such as landings, cable yarding corridors, etc., associated with timber harvesting on acres in adjacent management areas. Impacts should be restored to ensure maintenance of Backcountry characteristics through activities such as obliterating and reforesting road relocations or landings.

### **Management Approach**

Roads that are identified as unneeded system roads are prioritized for decommissioning and unauthorized roads prioritized for obliteration.

### **Recreation**

#### **Desired Conditions**

- BAC-DC-12** The desired recreation setting in Backcountry is semi-primitive non-motorized throughout the management area, which provides opportunities for solitude, risk, and challenge in remote areas. The predominant means of access is over non-motorized trails, although public motorized access is allowed on a few open roads.
- BAC-DC-13** Non-motorized recreation provides opportunities for solitude, risk, and challenge in remote areas. The predominant means of access is over non-motorized trails, although limited public motorized use is allowed on a few open roads.
- BAC-DC-14** Non-motorized trail opportunities exist across the area and are designed for high quality user experiences and resource protection. Trail classes range from 1 (minimally developed) to 3 (moderately developed) with features and structures consistent with a Semi-primitive Non-motorized setting.
- BAC-DC-15** Recreation facilities are generally limited to trailheads and provide for visitor health and safety or resource protection rather than user comfort or convenience.

### **Scenery**

#### **Desired Conditions**

- BAC-DC-16** Desired scenic character is natural evolving to natural-appearing throughout the management area.

- BAC-DC-17** Proposed actions are designed to meet or exceed the following desired SIOs on lands inventoried as the corresponding scenic classes:

**Backcountry Management Area**

Inventoried Scenic Class	Desired Scenic Integrity Objective
All scenic classes	High

## Management Area: Ecological Interest Areas

### Background

**Ecological Interest Areas (EIAs)** are places where active management is desired to improve ecological species composition. Generally, these locations have fewer roads than the Matrix management area and contain some concentrations of high-quality natural communities or high quality current old growth, but these areas are not as biologically exceptional as Special Interest Areas. EIAs benefit from a management style that is focused on restoring and improving the unique values present, including perpetuating or enhancing plant or animal species and communities that are of national, regional, or state significance. Top priorities in this management area would be to restore community composition by treating stands with uncharacteristic vegetation. The need for balancing successional age classes at the landscape scale would not drive stand-level prescriptions. Ecological restoration would result in a mix of forest habitats of various ages, sizes, and configurations. Timber harvest, prescribed fire, non-native invasive treatments, and road construction are tools for achieving desired conditions.

### Desired Conditions

- EIA-DC-01** The natural role of fire is sustained or restored in appropriate ecozones, and prescribed fire plays an important role in the maintenance of many of the forested communities.
- EIA-DC-02** The desired recreation settings are semi-primitive non-motorized, semi-primitive motorized, and roaded natural. Interpretive information is available to develop understanding of the importance of protecting the plant and animal communities of the area. Open roads provide motorized access to the forest but to a lesser extent than in the Matrix and Interface management areas.
- EIA-DC-03** Desired scenic character is natural evolving to natural-appearing in semi-primitive recreation settings and rural forested, pastoral, or cultural/historic in roaded natural settings.
- EIA-DC-04** Proposed actions are designed to meet or exceed the following desired SIOs on lands inventoried as the corresponding scenic classes:

#### Ecological Interest Management Area

Inventoried Scenic Class	Desired Scenic Integrity Objective
1	High
2	Moderate
3	Low
4	Low
5-7	Low

### Standards

- EIA-S-01** These lands are classified as unsuitable for timber production.



- EIA-S-02** Timber harvest is allowed only when it does not result in departure from the desired community composition. Even-aged and two-aged regeneration harvests shall only be used to restore species composition.
- EIA-S-03** Natural ignitions can be managed for multiple resource objectives.
- EIA-S-04** Allow prescribed fire only where it will not negatively impact the desired community composition of the area. In ecological communities that specifically benefit from fire, design burn plans to restore or enhance community composition.
- EIA-S-05** Issue permits for collection of forest products and allow noncommercial mineral collection according to forestwide direction as long as unique values of the area are protected.
- EIA-S-06** Wildlife habitat improvements may be created, maintained, or enlarged if compatible with species for which the area is recognized.

### **Management Approaches**

Within this management area, the following types of timber treatments could be expected: removal of offsite species and regeneration to species that would be found in that ecozone; thinning to create woodland conditions and to remove encroaching mesic species; thinning and understory treatments to increase the species diversity of regeneration layers; use of group selection and variable retention systems to foster development of diverse species composition; harvest to accelerate development of late and old growth characteristics.

## Management Area: Special Interest Areas

### Background

**Special Interest Areas (SIAs)** are the most exceptional ecological communities that serve as core areas for conservation of the most significant and rare elements of biological diversity on the Forests. They represent communities of plants and animals that occupy a small portion of the landscape but contribute significantly to biological diversity. These areas are generally resilient and are not in need of active restoration, although maintenance activities may be needed to maintain their integrity.

Many SIAs have been identified in cooperation with the North Carolina Natural Heritage Program. SIAs may be nominated for placement on the NC state registry of natural areas. The NC state registry is a voluntary agreement that recognizes the protection and management of natural areas that support rare species and significant natural communities.

While all SIAs have high biological values, some are also recognized for other values including geology, tribal attributes, recreation and/or scenery. This management area contains five Forest Scenic Areas which are delineated by the SIA boundary: Looking Glass Rock, John Rock, and Big Ivy/Craggy Mountain on the Pisgah NF and Whitewater Falls and Glen Falls on the Nantahala NF.

In areas where there is an overlap of an SIA and other MA, the more restrictive plan components apply.

### Desired Conditions

- SIA-DC-01** The Forests' high-quality communities and rare species are supported and enhanced, contributing to biological diversity and ecological integrity.
- SIA-DC-02** The natural role of fire is sustained or restored in appropriate ecozones, and prescribed fire plays an important role in the maintenance of many of the forested communities.
- SIA-DC-03** The desired recreation settings in these areas include semi-primitive non-motorized, semi-primitive motorized, roaded natural, and rural. Interpretive information is available to develop understanding of the importance of protecting the plant and animal communities of the area. Open roads provide motorized access to the forest but to a lesser extent than in the Matrix and Interface management areas.
- SIA-DC-04** Desired scenic character is natural evolving to natural-appearing for semi-primitive recreation settings; and rural forested, pastoral, or cultural/historic for roaded natural and rural settings.
- SIA-DC-05** Forest Scenic Areas (Looking Glass Rock, John Rock, Big Ivy/Craggy Mountain, Whitewater Falls and Glen Falls) are managed to maintain or enhance the scenic character of the areas.

- SIA-DC-06** Proposed actions are designed to meet or exceed the following desired SIOs on lands inventoried as the corresponding scenic classes:

**Special Interest Management Area**

Inventoried Scenic Class	Desired Scenic Integrity Objective
1	High
2	Moderate
3	Moderate
4	Low
5-7	Low

**Standards**

- SIA-S-01** These lands are classified as unsuitable for timber production.
- SIA-S-02** Timber management is allowed only when these practices enhance the desired community composition of the area and meet one of the following purposes:
- i. Improve threatened, endangered, or SCC habitat;
  - ii. Restore, enhance, or maintain rare plant communities;
  - iii. Restore, enhance, or mimic historic fire regimes;
  - iv. Reduce insect and disease hazards;
  - v. Provide for public safety.
- SIA-S-03** Natural ignitions can be managed for multiple resource objectives.
- SIA-S-04** Allow prescribed fire only where it will not negatively impact the desired community composition of the area. In ecological communities that specifically benefit from fire, design burn plans to restore or enhance community composition.
- SIA-S-05** Salvaging of dead and dying trees is only allowed if compatible with the biological resource for which the area was established or for public health and safety.
- SIA-S-06** Allow new road construction only when justified by site-specific analysis and when biological values of the area can be protected and scenic values protected in the Forest Scenic Areas.
- SIA-S-07** Do not issue permits for collection of forest products nor allow noncommercial mineral collection, aside from activities coordinated with the Forests for research or tribal needs.
- SIA-S-08** Limit new trail sections to linking existing trails, for education and interpretation, or relocating trails for mitigating resource impacts.
- SIA-S-09** Maintain existing wildlife openings where they are not detracting from unique characteristics of the area.

**Table 11. Special Interest Areas\***

**Bald Mountains Geographic Area**

Area Name	Acres
Big Bald Mountain	131
Big Laurel Creek Gorge	607
Flint Mountain Boulderfields	70
FRB/Lower French Broad River Aquatic Habitat	189
Lovers Leap/Stackhouse Slopes	892
Murray Branch Slopes	221
Paint Rock Road Natural Area	17
Roan Mountain Massif	9,389
Salt Bin/Mount Sterling Creek Yellowwood Slopes	260
Spring Creek Gorge	727

**Black Mountains Geographic Area**

Area Name	Acres
Big Ivy/Craggy Mountain Forest Scenic Area (includes Brush Fence Ridge/Point Misery, North Fork Ivy Creek, The Craggies, Walker Cove, Craggy Mountain Recommended Wilderness and additional acres)	11,975
Black Mountains/Celo Knob Natural Area	5,361
Celo Community Natural Area	36
Sevenmile Ridge Wetlands	146
Toms Creek Natural Area	5
Upper Bowlens Creek Forests	2,105
Woods Mountain/Singecat Ridge	212
Bee Tree (Paynes Knob and Rock Knob)	234

**Eastern Escarpment Geographic Area**

Area Name	Acres
Bald Mountain Natural Areas	198
Grandfather Mountain	782
Johns Creek Natural Area	10
Linville Falls	52
Linville Gorge	10,002

Area Name	Acres
Linville Mountain Dolomite Areas	151
Linville River Aquatic Habitat	9

#### Fontana Lake Geographic Area

Area Name	Acres
Cheoah Mountains Old Roughy	245

#### Great Balsam Geographic Area

Area Name	Acres
Alarka Laurel	2,132
Bryson Branch Falls and Cove	76
Tanasee Bald/Tanasee Ridge	680
Western Plott Balsam Natural Area	379

#### Highland Domes Geographic Area

Area Name	Acres
Blackrock Mountain/Granite City	677
Bonas Defeat	542
Cedar Cliff/The Pinnacle	2,064
Chattooga River Gorge/Ellicott Rock	2,071
Cole Mountain/Shortoff	112
Cullasaja	1,958
Dismal Falls	249
Dulany Bog	231
Fodderstacks	227
Glen Falls Forest Scenic Area	120
Henry Wright/Kelsey Hemlock Forests	245
Horsepasture River Gorge	1,123
McDowell Mountain	428
Panthertown Valley	2,761
Piney Knob Fork	33
Scaly Mountain and Catstairs	133
Silver Run Preserve/Sassafras Mountain	1,691

Area Name	Acres
Slick Rock	11
Thompson River Gorge	1827
Walking Fern Cove	25
Whiteside Mountain/Devils Courthouse	765
Whitewater River Falls and Gorge (including Forest Scenic Area)	1,341

#### Hiwassee Geographic Area

Area Name	Acres
Appalachia Lake Old-Growth Site	68
Die Bend-Crowder Bluff	52
Lower Hiwassee River Aquatic Habitat	14

#### Nantahala Gorge Geographic Area

Area Name	Acres
Nantahala Gorge	3,301

#### Nantahala Mountains Geographic Area

Area Name	Acres
Buck Creek Serpentinized Olivine Barrens	1,342
Chunky Gal/Riley Knob	463
Doubletop Mountain/Cedar Cliff Mountain East	902
Doubletop Mountain/Cedar Cliff Mountain Hannah Mt	69
Doubletop Mountain/Cedar Cliff Mountain Northeast	19
Doubletop Mountain/Cedar Cliff Mountain West	229
Nantahala River Bogs	109
Pickens Nose /Little Ridgepole Mountain	3,738
Runaway Knob	227
Standing Indian Mtn	2,210
Tallulah River Headwaters	1,175
Upper Hiwassee River Aquatic Habitat	18
Upper Nantahala Gorge	1,568

Area Name	Acres
Wayah Bald and Wine Spring Bald	2,036
White Oak Stamp	583
Wildes Cove	9

#### North Slope Geographic Area

Area Name	Acres
Dix Creek/Cold Mountain	192
Fork Ridge/Mount Hardy	624
Mount Pisgah	756
Richland Balsam/Beartrail Ridge	1,744

#### Pisgah Ledge Geographic Area

Area Name	Acres
Chestnut Bald-Flat Laurel Creek-Sam Knob	706
Devils Courthouse	120
Frying Pan Gap	1,520
Johns Rock Forest Scenic Area	539
Looking Glass Rock Forest Scenic Area	1,739
Pink Beds	1,486
Pisgah Ridge/Pilot Mountain	4,623

#### Unicoi Mountains Geographic Area

Area Name	Acres
Cheoah Bald	1,924
Cheoah Mountains Hazanet	381
Cheoah River Floodplain	496
Huckleberry Bald	504
Joyce Kilmer Wilderness Area	13,810
Santeetlah Bluffs/Stratton Meadows	1731
Santeetlah Bluffs/Wright Creek	355
Snowbird Creek/Hooper Bald	2,729

\*Many of the SIAs fall within management areas that have more restrictive plan components, or overlap other SIAs. In areas where there is an overlap of an SIA and other MA, the more restrictive plan components apply.

## Management Area: Administrative Sites

### Background

The Administrative Sites management area includes Forest Service facilities and grounds used to manage the operations of the Forests, including ranger district offices, Job Corps Centers, work centers, and the Genetic Resource Management Areas and other facilities. The Genetic Resource Management Areas include the Beech Creek and Chilhowie Seed Orchards (the latter of which is located on the Cherokee National Forest but managed by this plan). Sites are managed to serve and support resource programs and are maintained to protect capital investments.

The main priorities for managing Forest Service facilities are safety and maintenance of existing assets. Decisions about the locations of new administrative facilities, such as offices, work centers, and storage buildings, are a project determination and not in the forest plan.

Once an area is committed to an administrative site, facility, or structure, there is a long-term commitment of resources. Proposals will be analyzed on a case-by-case basis at the project level.

### Desired Conditions

- AS-DC-01** Facilities reflect the natural and cultural landscape and provide optimal service to Forest Service personnel and visitors of the Forests. They are maintained in good working condition, safe, clean, structurally sound, energy efficient, and accessible to all users. Where recreational amenities are provided, the desired recreation setting is rural.
- AS-DC-02** Desired scenic character is rural forested, pastoral, or cultural/historic.
- AS-DC-03** Proposed actions are designed to meet or exceed the following desired SIOs on lands inventoried as the corresponding scenic classes:

#### Administrative Sites Management Area

Inventoried Scenic Class	Desired Scenic Integrity Objective
All scenic classes	High, Moderate or Low; Consult with Forest Engineer and Forest Landscape Architect during project design.

**See also:** Chapter 2: Lands and Special Uses, Facilities



## Management Area: Research Natural Areas

### Background

Research Natural Areas (RNAs) represent current natural conditions, and designation of these areas allows natural physical and biological processes to prevail without human intervention. They will be managed for scientific research. They are managed in an undisturbed state as a baseline for comparison with other forest environments; however, under unusual circumstances, management may be used to maintain the unique features that the RNAs were established to maintain. The two existing Research Natural Areas are Black Mountain and Walker Cove. Both are located on the Appalachian Ranger District of the Pisgah National Forest.

**Table 12. Research Natural Areas**

Name Year. Established	Description	Geologic and Botanical Features
Black Mountain 1933	1405 acres in the Black Mountain range (which contains the highest peaks east of the Mississippi River). Visible from highways of Western North Carolina. Lies in watershed of South Toe River, elev 3000–6600 ft.	Representative of the virgin growth of red spruce, balsam fir, and northern hardwoods, including yellow birch, buckeye, beech, maple, and oak.
Walker Cove 1965	55 acres along the NE slope of Walker Ridge, elev 3800–4500 ft. Old growth stand of Southern Appalachian hardwoods–sugar maple and associated species. Sapstreak disease ( <i>Endoconidiphora virescens</i> ) was first reported here.	Sugar maple–beech–yellow birch and associates. Carolina gneisses, metamorphic rock of unknown origin.

### Desired Conditions

- RNA-DC-01** The Walker Cove and Black Mountain RNAs remain free of anthropogenic disturbance and continue to provide a baseline for natural forest community conditions and support relevant forest research.
- RNA-DC-02** Research and development, study, observation, and monitoring proceed without modifying the conditions for which the RNAs were established.
- RNA-DC-03** Water resources are unaltered by anthropogenic modifications.
- RNA-DC-04** These areas provide a semi-primitive non-motorized recreation setting and are characterized by an essentially unmodified natural environment. Recreational use is limited to foot travel and areas have no developed facilities.
- RNA-DC-05** The desired scenic character is natural evolving to natural-appearing.

- RNA-DC-06** Proposed actions are designed to meet or exceed the following desired SIOs on lands inventoried as the corresponding scenic classes:

**Research Natural Area**

Inventoried Scenic Class	Desired Scenic Integrity Objective
All scenic classes	Manage scenery to be compatible with research goals and to be consistent with SIOs of adjacent management areas.

**Standards**

- RNA-S-01** Prohibit use that would impair research or educational value.
- RNA-S-02** Provide no direct habitat improvements for fish or wildlife.
- RNA-S-03** This management area is not suitable for timber production.
- RNA-S-04** Allow no gathering of forest products.
- RNA-S-05** Allow no new developed facilities.
- RNA-S-06** Manage for Semi-primitive Non-motorized conditions. Provide no opportunities for vehicles commonly classified as ORV's, including four-wheel-drive vehicles.
- RNA-S-07** Provide no new trails.
- RNA-S-08** Allow no commercial recreation use.
- RNA-S-09** Stipulate no surface occupancy for any new lease.
- RNA-S-10** Allow no prescribed burning.
- RNA-S-11** Do not allow road construction or reconstruction or maintenance of historic roads.
- RNA-S-12** Coordinate with the station director concerning any research proposals.
- RNA-S-13** Management of Inventoried Roadless Areas within Research Natural Areas shall conform to IRA management direction in Backcountry MA, in addition to Research Natural Area management area direction. Where RNA management area direction differs from IRA direction for roads or vegetation management, the more restrictive direction applies.

**Guidelines**

- RNA-G-01** Allow no tree cutting or vegetation management to take place, except to protect public health and safety or to meet pest management objectives.
- RNA-G-02** Control fire with hand tools if possible. Favor the use of water rather than retardant.
- RNA-G-03** Retain soils in a natural, undisturbed state, except for wildfire control measures. Favor natural healing of disturbed sites.
- RNA-G-04** Restrict mineral activities to retain the characteristics of the area.
- RNA-G-05** Issue permits for scientific study where compatible with management area objectives.

- RNA-G-06** Use integrated pest management practices to control insect and disease only to prevent spread outside the area.

## Management Area: Experimental Forests

### Background

Experimental Forests provide the Forest Service and other researchers with real-world laboratories in which to conduct long-term science and management studies aimed at enhancing the health, productivity, and diversity of the nation's forests and improving forestry practices. Even though many management activities take place on these lands, they are not a part of usual Forest programs. These lands are dedicated to experimentation and education and are designated for national and international research programs. The Nantahala and Pisgah National Forests have three experimental forests – Bent Creek in Buncombe County near Asheville, Coweeta Hydrologic Laboratory, and Blue Valley in Macon County.

Established in 1925 to research rehabilitating forests damaged by overharvesting and promote sustainable forestry, the Bent Creek Experimental Forest in the Pisgah National Forest is the oldest Federal experimental forest east of the Mississippi. Bent Creek has a research emphasis of upland hardwood ecology and silviculture and is also unique for its immediate proximity to the population center of Asheville. This has become a popular recreational destination, although the Congressional intent of the area is focused on forestry research. A portion of the Bent Creek Experimental Forest has been developed as a regional center for study of trees and other woody plants in cooperation with the Western North Carolina Arboretum.

The Nantahala National Forest contains the other two experimental forests. The Coweeta Hydrological Laboratory, established in 1934, has conducted the longest continuous forested landscape research in North America and contains one of the oldest gauged watersheds in the world. Coweeta is also part of the UNESCO Man and the Biosphere program contributing long-term ecological research. The Blue Valley Experimental Forest, the lesser known of the three experimental forests, provides researchers with data on eastern white pine and associated hardwoods. A portion of the Blue Valley Experimental Forest overlaps with the Overflow Wilderness Study Area.

Experimental Forest	Year Established
Bent Creek	1925
Coweeta Hydrologic Laboratory	1934
Blue Valley	1964

### Desired Conditions

- EXF-DC-01** Experimental forests serve as a reference for documenting ecological and hydrological conditions and functions, thus providing data and information that can inform the science of forestry and forestry management, including assessing forest health conditions and ecosystem functions in a changing climate.
- EXF-DC-02** Experimental forests provide a basis for experimentation to develop information and tools to address emerging specific science or management questions relevant to Appalachian landscapes.
- EXF-DC-03** Tree species composition will vary within the experimental forest. Areas of active management and research activities may be obvious.
- EXF-DC-04** Non-native invasive plants are controlled.

- EXF-DC-05** Rare communities and their associated species including threatened and endangered species, and species of conservation concern are provided for.
- EXF-DC-06** Aquatic habitats conditions and associated communities of native, desired non-native, and/or demand species are sustained or improved.
- EXF-DC-07** Although research is the emphasis in these areas, recreation use does occur in some locations and the desired recreation setting is roaded natural. The scenic character is predominantly natural appearing, but deviations exist with moderate to substantial evidence of human modification. Interpretive information may be present within this setting for the enhancement of the visitor's recreational and educational experience.
- EXF-DC-08** Proposed actions are designed to meet or exceed the following desired SIOs on lands inventoried as the corresponding scenic classes:

**Experimental Forest Management Area**

Inventoried Scenic Class	Desired Scenic Integrity Objective
All scenic classes	Research or management activities within experimental forests are not required to meet any specific SIO.

**Standards**

- EXF-S-01** Forest activities must be compatible with research objectives, including but not limited to dispersed recreation, wildlife and fish habitat activities, stream restoration, timber management, soil and water resource management, roads management construction, reconstruction and design, and prescribed fire management.
- EXF-S-02** All vegetation management activities on the experimental forests require approval from the Southern Research Station.
- EXF-S-03** Require approval by the chief of the Forest Service for any new mineral permits or leases in experimental forests.
- EXF-S-04** Roads will be managed for Roaded-Natural conditions only.
- EXF-S-05** Provide non-motorized trail opportunities only.
- EXF-S-06** Allow no dispersed overnight camping within Coweeta Experimental Forest, the Western North Carolina Arboretum, or Bent Creek Experimental Forest. Except within developed or designated sites, allow no camping in Blue Valley Experimental Forest or Bent Creek.
- EXF-S-07** The trail system in Bent Creek Experimental Forest will not be expanded, except to support research goals or to relocate exiting trails to protect resources.
- EXF-S-08** Lands in this management area are not suitable for timber production.
- EXF-S-09** Forest production collection permits shall not be issued for this management area.
- EXF-S-10** All new special use permit issuances must have a primary purpose of education or research. Permit approvals require coordination with the station director or designated representative. Ensure that no ongoing or projected experiments are interrupted.

Special use permits for recreation events and non-commercial group user activities shall not be authorized.

- EXF-S-11** Land exchanges and rights-of-way are approved only when research objectives are met. These activities require coordination with the station director or designated representative to ensure that no ongoing or projected experiments are interrupted.
- EXF-S-12** Existing wildlife fields, linear wildlife habitats, old fields, balds, and other permanently open wildlife habitats are present and maintained, provided it does not compromise experimental forest values. Some of these permanent openings may provide more shrub/sapling habitat as a result of longer maintenance cycles.
- EXF-S-13** Creation of brushy interface adjacent to or expansion of existing wildlife habitats described above is permitted, provided it does not compromise experimental forest values.
- EXF-S-14** Construction of new permanent wildlife fields and linear wildlife habitats is permitted, provided it does not compromise experimental forest values.
- EXF-S-15** Design experiments, access roads, wildlife habitat improvements, and/or vegetation management activities to minimize impacts to scenery where proposed actions may be visible from the Appalachian National Scenic Trail, Mountains-to-Sea National Recreation Trail, or the Blue Ridge Parkway, provided it does not compromise experimental forest values.

### **Guidelines**

- EXF-G-01** Wildfires should be suppressed unless they meet the current and future research or education objectives of the experimental forest. When managing fires, consult current research map products to ensure compatibility with research and resource objectives.

### **Management Approaches**

Manage forest health threats to meet research objectives or to protect adjacent lands. Streams and water bodies are periodically inventoried and monitored on an individual stream basis to characterize conditions or trends.

Public education should emphasize the importance of the experiment forest and its research work, as well as the need for various user groups to show respect for each other's needs and safety.

Consult with ranger district and/or Forest recreation program managers when planning proposed actions within a half mile of nationally designated trails or the Blue Ridge Parkway.

## Management Area: Appalachian National Scenic Trail Corridor

### Background

The Appalachian National Scenic Trail (ANST) was established by Congress in the National Trails System Act of 1968. The ANST is administered by the Secretary of the Interior in consultation with the Secretary of Agriculture and managed as a partnership among the U.S. Forest Service, the National Park Service, the Appalachian Trail Conservancy (ATC), and local ATC-affiliated maintainer clubs. Management is in accordance with the National Trails System Act and the Appalachian Trail Comprehensive Plan utilizing the cooperative management system. Along with the USFS, the NPS and ATC plan and carry out management actions and programs to protect, enhance, and ensure that uses do not substantially interfere with the nature and purposes of the ANST.

On the Nantahala and Pisgah National Forests, the ANST crosses the Tusquitee, Nantahala, Cheoah, and Appalachian Ranger Districts. Except where it passes through management areas with more restrictive direction, this corridor management area consists of those lands mapped as the visible foreground from the ANST footpath and associated features such as shelter and privy sites, designated overnight sites, water sources, vistas, and spur trails.<sup>29</sup>

Management practices within the ANST corridor management area are designed to protect or enhance the ANST experience, preserve and strengthen the role of volunteers and volunteer organizations, provide opportunities for high quality outdoor recreation, and provide for the conservation and enjoyment of the nationally significant scenic, historic, natural, and cultural qualities of the land through which the ANST passes.

Within the ANST corridor management area, wildlife habitat improvements and vegetation management may occur if activities maintain or enhance the ANST environment or user experience. Outside the ANST corridor management area, other National Forest lands within the ANST viewshed are managed for multiple uses under the provisions of this Plan, in a manner which will reasonably harmonize with and be complementary to the ANST experience.

### Desired Conditions

- AT-DC-01** The ANST is a way, continuous from Katahdin in Maine to Springer Mountain in Georgia, traversing the Nantahala and Pisgah National Forests for travel on foot through the wild, scenic, wooded, pastoral, and culturally significant lands of the Appalachian Mountains. The ANST is usually a simple footpath, purposeful in direction and concept, favoring the heights of land, and located for minimum reliance on construction for protecting the resource. The body of the trail is provided by the lands it traverses, and its soul is in the living stewardship of the volunteers and workers of the ANST community.
- AT-DC-02** Views from the ANST are predominantly forested, sporadically intermixed with meadows, old fields, pastoral valleys, and cultural landscapes. Occasionally, the ANST traverses high-elevation balds and openings, which afford hikers unique and outstanding views. The ANST offers a diversity of topography and a variety of vegetation

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<sup>29</sup>The foreground corridor extends up to ½ mile from the ANST footpath and associated features. Corridor mapping was done based on topographic screening in a manner consistent with adjacent National Forests, utilizing methods described in the U.S. Forest Service “Scenery Management System” (Landscape Aesthetics, Agriculture Handbook 701).

and animal life exposing the hiker to the entire range of landforms, water features, history, and cultural uses of the land that are found along the Appalachian Mountains.

- AT-DC-03** ANST facilities include the footpath itself, shelters approximately one day's hike apart, designated overnight sites, privies, trailhead parking areas, spur trails, and information boards at road crossings. The footpath is designed, constructed, and maintained for foot travel only and to wear lightly on the land. Associated structures are in harmony with the surrounding environment.
- AT-DC-04** The ANST traverses primitive, semi-primitive non-motorized, semi-primitive motorized, roaded natural and rural recreation settings, and is managed to be consistent with desired recreation settings as mapped for each location within the corridor management area. . Trailheads are sensitive to scale and character and set the tone for a non-motorized experience. Motorized recreation, bicycles, horses, and pack stock are not present on the ANST footpath, except for authorized administrative use or at intersecting roads or trails. National forest roads within a half mile of the ANST are managed with consideration for hiker security, safety, and ANST values.
- AT-DC-05** Roads, utility transmission corridors, or communication facilities exist and may be visible within the corridor, although the goal is to avoid these types of facilities and land uses to the greatest extent possible and blend facilities which cannot be avoided into the landscape so that they remain visually subordinate.
- AT-DC-06** The ANST corridor management area retains a natural, forested, or pastoral scenic character shaped by both natural processes and humans. While stands of old growth continue to develop in locations throughout the area, where appropriate, vegetation management activities are designed with recognition of the nationally significant aesthetic and recreational values of these lands. Low intensity vegetation management is appropriate to maintain the long-term goals and stewardship objectives of the ANST corridor management area. Management activities needed to preserve, maintain, or create vistas, desirable open areas, and balds are a high priority. Activities are planned and carried out in cooperation with appropriate ANST management partners.
- AT-DC-07** Existing wildlife fields, balds, and linear wildlife habitats are sustained. Some of these permanent openings may provide more shrub/sapling habitat as a result of longer maintenance cycles.
- AT-DC-08** Desired scenic character is consistent with the following themes: natural evolving in primitive recreation settings; predominately natural evolving, natural-appearing, or pastoral in semi-primitive settings; and natural appearing, rural forested, pastoral, or cultural/historic in roaded natural or rural settings.



- AT-DC-09** Proposed actions are designed to meet or exceed the following desired SIOs on lands inventoried as the corresponding scenic classes:

**ANST Corridor Management Area**

Inventoried Scenic Class	Desired Scenic Integrity Objective
All scenic classes	High  (Exceptions to the SIO may be allowed in coordination with the ATC for open area management or shelter and overnight site developments)

**Objectives**

- AT-O-01** Tier 1: Update group volunteer agreements between ranger districts and ATC-affiliated maintainer clubs on a five-year cycle or more frequently if needed. For consistency, favor developing multi-district group volunteer agreements where appropriate.

**Standards**

- AT-S-01** The ANST corridor management area is unsuitable for timber production.
- AT-S-02** Vegetation management in the ANST corridor management area shall maintain or enhance the ANST environment or user experience. Allow timber harvest, prescribed burning, wildfire, hand tools, power tools, mowing, herbicides, biological controls, or grazing to manage vegetation as appropriate. Vegetation management may be used for the following purposes:
- Maintaining, expanding, or creating desirable open areas, balds, old field habitats, or vistas that enhance scenic qualities or visitor experience of the ANST
  - Controlling diseases, insects, or non-native invasive vegetation
  - Ecological restoration or managing for resiliency in the face of change
  - Maintaining or improving habitat for threatened and endangered species, and species of conservation concern Maintaining, restoring, or expanding habitat for rare communities, species dependent on disturbance, or wildlife viewing opportunities
  - Meeting trail construction or maintenance needs, including shelters or other associated features
  - Managing fuels or mimicking historic fire regimes
  - Providing for public safety or resource protection
- AT-S-03** Management activities within or outside the ANST Corridor which are potentially visible from the footpath or associated features shall be planned in cooperation with the ATC and affiliate maintainer clubs.
- AT-S-04** Project-level analysis of potential scenery impacts shall be done during leaf-off season.

- AT-S-05** Authorize new roads within the ANST corridor management area only if entering the management area is the only feasible and prudent location and the road is not visible from the ANST footpath or associated features.
- AT-S-06** Prohibit hauling or skidding along or across the ANST footpath or using the footpath as a landing or temporary road. Hauling or skidding in other locations within the corridor management area is allowed only if site-specific analysis indicates that it is the only feasible and prudent alternative, and that activities are not visible from the ANST footpath or associated features.
- AT-S-07** Motorized, horse, pack stock, and bicycle use on the ANST is prohibited. Exceptions include where the ANST crosses or is located on open Forest Service system roads or trails designated for those uses; federal, state, or other public roads; or as needed for ANST management, administrative access, or emergency purposes. Other uses within the ANST corridor management area, including crossings of the ANST, may be considered following coordination with appropriate ANST partners. Locate authorized uses crossing the ANST to minimize impacts to the ANST environment, preferably where impacts already exist.
- AT-S-08** Overnight camping is allowed within the ANST Corridor management area, except as prohibited or restricted by Regional Forester's order.
- AT-S-09** Commercial special use recreation events shall not be authorized on the ANST except on intersecting or overlapping trails if approved in coordination with the ATC.
- AT-S-10** Authorize outfitting and guiding special uses only when they do not adversely affect ANST values or where there is an educational or service component. Group size will be limited to ten (10) including guides.
- AT-S-11** Outfitting and guiding permits will not be issued for overnight camping at ANST shelters, designated overnight sites, or within 300 feet of the footpath.
- AT-S-12** Allow agricultural special-use authorizations or agreements only to maintain open and pastoral spaces and when consistent with wildlife habitat requirements, cultural needs, and scenery management objectives.
- AT-S-13** Do not authorize vendor or peddler permits.
- AT-S-14** The ANST corridor management area is unsuitable for special-use authorizations for new communication or energy generation sites.
- AT-S-15** Prohibit heavy equipment fire-line construction on or across the ANST footpath, unless necessary for emergency protection of property or public safety.
- AT-S-16** Management of Inventoried Roadless Areas within the ANST management area shall conform to IRA management direction in Backcountry MA, in addition to ANST management area direction. Where ANST management area direction differs from IRA direction for roads or vegetation management, the more restrictive direction applies.

## **Guidelines**

- AT-G-01** Spur or side trails to the Appalachian Trail (identified in ANST Local Management Plans) should be managed primarily as non-motorized trails designated for foot travel. Minor exceptions, such as sharing with motorized uses, may be allowed where there are no other reasonable alternatives.

- AT-G-02** Trail facilities (trail shelters, tent platforms, trailheads, and similar facilities) located within or outside the ANST Corridor Management Area and identified in the ANST local management plan are considered a component of the overall ANST system. These facilities should be managed to be consistent with direction in the ANST Management Area.
- AT-G-03** Trail shelters, designated overnight sites, and privies may be located, maintained, or replaced where there is a demonstrated need for overnight use. Each facility should be periodically evaluated for need, improvement, relocation, or removal.
- AT-G-04** Minimum Impact Suppression Techniques (MIST) should be the primary fire suppression strategy within the ANST Corridor.
- AT-G-05** Implement needed restorative measures after prescribed fire or wildfire suppression efforts have ceased.

### **Management Approaches**

Identify the ANST footpath and spur trails with standard blazes and signs.

Reconstruct or relocate existing portions of the ANST as needed to enhance the recreation experience; improve trail sustainability; provide for threatened and endangered species, and species of conservation concern; or to protect heritage resources. Such relocations provide a reasonable level of public safety.

When locating or relocating shelter or designated overnight sites within the ANST corridor management area, locate no closer than two miles from open roads and access points where possible.

If monitoring and analysis of social and resource conditions determines that recreation outfitting and guiding special use capacity along the ANST has been reached, a process should be developed to assign user days.

Coordinate with the ATC to monitor visitor use and develop and implement visitor use management strategies to maintain ANST values and desired visitor experiences. Such strategies may include visitor capacity studies and assignment of visitor capacities if warranted.

**See also:** Forestwide: Scenery; Dispersed Recreation; Geographic Areas: Nantahala Mountains, Nantahala Gorge, Unicoi Mountains, Fontana Lake, and Bald Mountains; MAs: Congressionally Designated Wilderness, Recommended Wilderness, Roan Mountain, Heritage Corridors, and Experimental Forests.

## Management Area: National Scenic Byways

### Background

Driving for pleasure and sightseeing is one of the most popular outdoor-recreation pursuits in the nation and state of North Carolina. National Scenic Byways are administrative designations recognized by the Federal Highway Administration and are part of a larger network of scenic routes that exist throughout the country. This management area includes the scenic corridors along the Blue Ridge Parkway, Cherohala Skyway, and portions of the Forest Heritage National Scenic Byway recognized by the Federal Highway Administration. These byways are nationally designated because of their scenic beauty and the opportunity they provide to view the scenic, natural, and cultural landscapes of western North Carolina.

There is a management guide for the Forest Heritage Scenic Byway to be applied consistently with this direction.

Note that there are other Forest Service byways (those not nationally recognized by the Federal Highway Administration) in the Interface Management Area, and NC State Scenic Byways traverse the forest across multiple management areas.

### Desired Conditions for all National Scenic Byways

- SB-DC-01** These areas have desired recreation settings of roaded natural or rural and provide exceptional opportunities for motorized recreation, especially scenic driving. Views along the byways have a predominately forested appearance but are interspersed with developed, pastoral, or cultural/historic elements. Scenic landscapes include a variety of landforms and vegetation patterns which provide colorful accents and interesting textures that change with the seasons. Water, geologic features, and cultural landscapes such as fields, meadows, or rustic structures provide scenic diversity.
- SB-DC-02** Interpretive facilities and services such as trails, signs, viewing areas, self-guided programs, and buildings are provided to enhance the understanding of, and appreciation for the natural environment, cultural resources, and the byway's special features.
- SB-DC-03** Road corridor improvements and interpretive facilities are evident changes to the natural environment, but these man-made alterations fit well with the character of the surrounding landscape and do not diminish the visual quality of the natural environment.
- SB-DC-04** Signage along the byways provides easily understood directional, interpretive, and cautionary information with a minimum of visual distraction. Scenic, historic and/or natural resources are interpreted for the benefit of visitors.
- SB-DC-05** The potential for encounters with other forest visitors is seasonally moderate to high, especially at byway facilities, which include pullouts, overlooks, interpretive kiosks, trails, restrooms, and picnic sites.
- SB-DC-06** Most, if not all, facilities are designed to accommodate persons with disabilities.
- SB-DC-07** Biological communities are maintained to provide an attractive setting for visitors, while providing for rare communities, threatened and endangered species, and species of conservation concern. Existing old fields, pastoral areas, and wildlife openings are

sustained. Some openings provide permanent shrub/sapling habitats as a result of longer maintenance cycles.

- SB-DC-08** Forest management activities maintain the natural characteristics that make the area scenic. Timber harvest is appropriate to maintain a resilient forest with sensitivity to byway values, and the frequency and intensity of harvest are generally low.
- SB-DC-09** The desired scenic character is predominately rural forested with pockets of pastoral and historic/cultural elements such as historic structures, old fields, or wildlife openings.
- SB-DC-10** Proposed actions are designed to meet or exceed the following desired SIOs on lands inventoried as the corresponding scenic classes:

**Scenic Byway Management Area**

Inventoried Scenic Class	Desired Scenic Integrity Objective
All scenic classes	Low, Moderate, or High for any proposed action directly benefitting scenery, scenic byway values, or recreational experiences within the corridor; and High for all other proposed actions.

**Standards**

- SB-S-01** Allow vegetation management activities (including timber harvest, prescribed fire, and salvage) to:

Enhance or rehabilitate scenery, including:

- i. Create aesthetically desired stand structure and species composition, including a mosaic of tree species of various densities and stem sizes, woodland characteristics, and enhancement of fall color species;
- ii. Feature flowering trees, character trees, and shrub species;
- iii. Maintain open areas, old field habitats, pastoral settings, and vistas that enhance the scenic qualities of the corridor;
- iv. Maintain developed recreation facilities, including roads and trails;
- v. Enhance both game and non-game wildlife habitat;
- vi. Improve threatened and endangered species, and species of conservation concern habitat;
- vii. Maintain rare communities and species dependent on disturbance;
- viii. Reduce fuel buildups;
- ix. Minimize impacts from insect or disease outbreaks and rehabilitate damaged areas;
- x. Control non-native invasive vegetation; or
- xi. Provide for public health and safety.

- SB-S-02** This corridor is unsuitable for timber production, although timber harvest may occur if the desired SIO can be met.

- SB-S-03** Allow wildlife and fisheries habitat improvements, including construction of new permanent wildlife fields and linear wildlife habitats to enhance wildlife viewing and fishing opportunities in accordance with SIOs. Watchable wildlife species habitat improvements are encouraged.
- SB-S-04** Creation of brushy interface adjacent to or expansion of existing wildlife fields and linear wildlife openings will not exceed 100 feet in any direction or a doubling of the current opening size, whichever is smaller.
- SB-S-05** Scenic Byway corridors are not suitable for designation of new utility corridors, utility rights-of-way, or communication sites, however existing uses can continue.

### **Management Approaches**

Road-side vistas are maintained, and selective removal and limbing of adjacent overstory trees open views.

Work with NC DOT on road surface maintenance and directional signage to ensure visitor safety.

Continue to support local tourism boards to share information about the Byways and their amenities.

**See also:** Byway Management Plans

### **Blue Ridge Parkway National Scenic Byway**

The Blue Ridge Parkway is a 469-mile motor route administered by the National Park Service that crosses landscapes with views of spectacular mountain and valley vistas, quiet pastoral scenes, sparkling waterfalls, colorful wildflower and foliage displays, as well as signage and visitor centers that provide interpretation of mountain history and culture. Established in 1936 to provide a safe, uninterrupted scenic route through the Southern Appalachian Mountains, the Parkway stretches from the George Washington National Forest and passes through the National Forests in North Carolina before terminating in the Great Smoky Mountains National Park. The Blue Ridge Parkway itself is managed by the Department of Interior, but the lands that are seen from the Parkway up to one half mile are included in the management area.

### **Desired Conditions**

- SB-DC-12** Views from the Blue Ridge Parkway are maintained, rehabilitated, or enhanced.

### **Management Approaches**

Coordinate with the National Park Service to manage shared and adjacent resources.

Emphasize cross-boundary coordination with the National Park Service on restoration efforts when communities are present on both NPS and NFS lands.

Prescribed fires and wildfire management are coordinated with the National Park Service to accomplish both Park Service and Forest Service management objectives in this corridor and adjacent management prescriptions. Wildfires are managed in cooperation with the National Park Service using an appropriate management response to protect Parkway resources and visitor safety.

## **Cherochala Skyway National Scenic Byway**

Beginning in Tellico Plains, TN, the Cherochala Scenic Byway extends from the Great Valley of Tennessee across the Unicoi Mountain Range to the mountain plateau of western North Carolina at Robbinsville, NC and promotes a wide range of recreation opportunities and economic growth in the region. Completed and dedicated in 1996, 18 miles of the 43-mile Cherochala Scenic Byway passes through the Nantahala National Forest, exposes visitors to scenic views, and is a destination driving experience for automobile and motorcycle enthusiasts. The portion of the Byway that runs through the Cherokee National Forest is managed by the Cherokee National Plan. The portion of the Byway that is covered by this management plan begins at the North Carolina border, proceeds south to east through the Nantahala National Forest, and terminates at the intersection of NC 143 and State Route 1127, Santeetlah Road, in Robbinsville NC.

### **Desired Conditions**

- SB-DC-13** Visitors will have opportunities to see and experience the natural and cultural history of the area, including the rich Cherokee and European settler and land use history.
- SB-DC-14** Habitat for the Carolina northern flying squirrel and associated red spruce communities is sustained or enhanced.
- SB-DC-15** Support native plant community restoration adjacent to the road while maintaining safe driving conditions.

### **Management Approaches**

Coordinate with the Cherokee National Forest on Byway management that crosses the administrative boundary.

## **Forest Heritage National Scenic Byway**

Designated as a National Forest Scenic Byway in 1989, the Forest Heritage Scenic Byway offers travelers an opportunity to step back in time and explore history, meanwhile enjoying beautiful scenery and outdoor recreation. Travelers will encounter historical markings of this area's original settlement, early logging practices, innovations in forest management, and the first school of forestry in the nation. Three visitor centers are found along the Byway, including the Pisgah Ranger Station, the N.C. Wildlife Resources Commission's Pisgah Center for Wildlife Education, and the Cradle of Forestry National Historic Site. The Forest Heritage Scenic Byway has the highest concentration of recreational facilities, scenic attractions, and visitors in the Pisgah National Forest. The portion of the Byway that is recognized as a Federal Highways Administrative National Scenic Byway begins at the intersection of US 64 and US 276 and proceeds northwest to the Big East Fork Trailhead on the border of Shining Rock Wilderness.

### **Desired Conditions**

- SB-DC-16** Visitors will have opportunities to gain a deeper understanding of the history of the Pisgah National Forest and the people who once called this area home.
- SB-DC-17** High quality recreation experiences are sustained and enhanced, with a focus on visitor safety, improving access, and reducing impacts to natural resources.
- SB-DC-18** The landscape is predominantly near-natural appearing with interspersed rural, agricultural, and pastoral areas.

**SB-DC-19** Wildflowers, herbaceous plants, and flowering trees enhance the pastoral experience and scenery.

**See also:** Forestwide Recreation



## Management Area: Heritage Corridors

### Background

As cited in the 1968 National Trails Act:

*National historic trails shall have as their purpose the identification and protection of the historic route and its historic remnants and artifacts for public use and enjoyment. Only those selected land and water-based components of an historic trail which are on federally owned lands and which meet the national historic trail criteria established in this chapter are included as Federal protection components of a national historic trail. (P.L. 90-543, as amended through P.L. 111-11, March 30, 2009).*

This management area consists of congressionally designated National Historic Trails (NHTs), National Millennium Trails, and other historic routes eligible for listing on the National Register of Historic Places (NRHP). Historic trails are administered through guidelines developed by the National Park Service (NPS) in conjunction with partners including the Forest Service, Native American tribes, state parks, non-profits, and private landowners. Associated landscapes of cultural significance are managed to maintain and restore their inherent cultural values through consultation with Native American tribes and Tribal Historic Preservation Officers (THPOs), the State Historic Preservation Officer (SHPO), the NPS, and other partners.

There are two NHTs located on the Nantahala and Pisgah National Forests: the American Revolution Overmountain Victory Trail and the Trail of Tears. The **American Revolution Overmountain Victory Trail (OMVT)** was designated in 1984. The 330-mile OMVT route, which was used to reach Kings Mountain during the American Revolution, crosses 7.6 miles on the Appalachian and Grandfather Ranger Districts of the Pisgah National Forest.

The **Trail of Tears**, originally established in 1987 and later extended by Congress in 2008 to include portions in North Carolina, is a total of 5,045 miles in length with 40.9 miles crossing the Nantahala National Forest along six connecting routes on the Cheoah, Nantahala, and Tusquitee Ranger Districts. The Trail of Tears National Historic Trail, a tribally recognized sacred site, commemorates the removal of the federally recognized tribes and the paths that 17 Cherokee detachments followed westward in 1838-1839.

The **National Millennium Trail Unicoi Turnpike (UT)**, Nantahala National Forest, is a commercial wagon road crossing the Southern Appalachians that was also used as part of the Trail of Tears route from North Carolina into Tennessee. The turnpike road was completed in 1816 as a commercial route across the Cherokee Nation from the head of navigation on the Savannah River in Georgia to the Little Tennessee River near Maryville, Tennessee. The TOT and UT routes often overlap.

The plan direction in this management area applies to a corridor around each trail totaling 1500 feet<sup>30</sup>, which is 750 feet on each side of the center line of the heritage trail. In addition to the plan direction in this management area, and as specified in the Forestwide section, tribes will be consulted prior to

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<sup>30</sup>This corridor width of 1500 feet is a default width to be used until the more precise location of the trail corridor is determined from the Cultural Landscape Inventory of the Trail. The 1,500 feet wide corridor was developed based upon National Historic Trail (NHT) guidelines that suggest a 200 – 300 meter [600 – 900 feet] buffer (either side) of a NHT be used to complete a Cultural Landscape Inventory. This direction when compared with the known locations of the Trail of Tears and Unicoi Turnpike and associated sites as well as their topographic conditions and view sheds on the Nantahala National Forest resulted in a designated buffer of 750' either side. Field visits with tribal members led to agreement as this would be the best way to proceed.

planning any activities within a distance of ½ mile<sup>31</sup> on either side of the Trail of Tears and Unicoi Turnpike, specifically alerting them if a proposed undertaking is within the mile wide trail corridor.

**Table 13. Heritage Corridors Miles**

<b>Corridor Name</b>	<b>Miles on the Nantahala and Pisgah National Forests</b>
Overmountain Victory Trail	7.64
Trail of Tears	40.9
Unicoi Turnpike	8.8

### **Desired Conditions**

- HC-DC-01** Heritage Corridors are managed for future generations in coordination with tribes, State Historic Preservation Officers, the National Park Service, and the Advisory Council on Historic Preservation. Tribal and cultural resources within the corridors are protected from adverse impacts, restored, preserved, and interpreted. Tribal interests shape the desired conditions and design of management activities.
- HC-DC-02** Tribal members have access to sacred sites for individual and group traditional ceremonies and rituals. There are opportunities for solitude, as well as privacy for ceremonial activities.
- HC-DC-03** Traditional uses such as the collection of medicinal plants and wild plant foods are recognized and allowed within sustainable limitations. Personal (non-commercial) gathering use of plants by tribal members at sustainable levels is not hindered.
- HC-DC-04** Restoration activities such as prescribed burning, timber harvesting, and management of invasive species, maintain or enhance the cultural and ecological historic conditions of the respective trails, including restoring native flora and fauna.
- HC-DC-05** Wildlife fields, linear wildlife habitats, and brushy interface emphasize historic condition and use of openings. Some openings may provide more shrub/sapling habitat as a result of longer maintenance cycles.
- HC-DC-06** Desired recreation settings range from semi-primitive non-motorized and semi-primitive motorized, to roaded natural and rural.
- HC-DC-07** Desired scenic character is natural-appearing for semi-primitive settings and rural forested, pastoral, or cultural/historic for roaded natural or rural settings.

<sup>31</sup>The one mile wide corridor (1/2 mile on either side of the Trail) was decided upon to meet the guidelines developed for National Historic Trail corridor widths in the absence of knowing all exact on-the-ground trail locations and associated sites. Tribes expressed a need for a one-mile wide corridor as needed for protection of tribal and cultural resources of the Trail of Tears and Unicoi Turnpike Sacred Site.

- HC-DC-08** Proposed actions are designed to meet or exceed the following desired SIOs on lands inventoried as the corresponding scenic classes:

**Heritage Corridor Management Area**

Inventoried Scenic Class	Desired Scenic Integrity Objective
1	High
2	Moderate
3	Moderate
4	Low
5-7	Low
Any scenic class for proposed actions benefiting heritage or cultural resources or for their interpretation	High, Moderate or Low

- HC-DC-09** Heritage Corridors are interpreted for the public for their cultural value: appropriate signage, access, and parking is determined in consultation with tribes and all other consulting parties.

## Objectives

- HC-O-01** Tier 1: Within two years of plan approval, a Cultural Landscape Report (CLR) for the long-term management, preservation, and treatment of the Trail of Tears and Unicoi Turnpike corridors will be initiated.
- HC-O-02** Tier 1: Within two years of the completed CLR, the Comprehensive Management Plan and finalized mapping of the Trail of Tears corridors will be initiated.
- HC-O-03** Tier 1: Within three years of plan implementation, a CLR should be completed for the long-term management, preservation, and treatment of the Overmountain Victory Trail.
- HC-O-04** Tier 1: Within five years of Comprehensive Management Plan approvals, implement signage as appropriate of historical routes for the Trail of Tears, Unicoi Turnpike, and Overmountain Victory trail.

## Standards<sup>32</sup>

- HC-S-01** Formally consult with tribes, the State Historic Preservation Office, and the National Park Service as appropriate to identify and determine the significance of cultural resources. Formal consultation with Native American tribes in compliance with historic preservation regulations including but not limited to the National Historic Preservation Act of 1966, as amended 1988 (NHPA) including section 106, National Environmental Policy Act 1969 (NEPA), Archeological and Historic Preservation Act of 1974 (AHPA), American Indian Religious Freedom Act of 1978 (AIRFA), Archaeological Resources Protection Act of 1979 (ARPA), Native American Graves Protection and Repatriation Act

<sup>32</sup> In addition to the plan direction in this management area, and as specified in the Forestwide section, tribes will be consulted prior to any proposed undertakings or ground disturbance prior to planning any activities within a distance of ½ mile on either side of the Trail of Tears and Unicoi Turnpike.

of 1990 (NAGPRA), and Executive Order 13007 Indian Sacred Sites of 1996 will be initiated and conducted by the Forest Service for all activities proposed with this management area.

- HC-S-02** Projects are designed to avoid, minimize, mitigate, or remove negative effects on the trails, sacred sites, and potentially significant cultural resources. Proposed and emergency activities within this area shall be reviewed to minimize or eliminate the potential for negative or adverse impacts to the characteristics for which the corridor was designated. Restoration, remediation, or recovery from natural or human caused activities or events will be considered in consultation with tribes, the State Historic Preservation Office, The National Park Service, the Advisory Council on Historic Preservation, and stakeholders.
- HC-S-03** Existing roads and facilities such as powerlines, roads, wildlife openings, recreational residences, marinas, and their associated structures shall be maintained in a way that does not result in adverse effects to the trail.
- HC-S-04** New activities that result in ground disturbance shall require tribal consultation and consultation with the State Historic Preservation Office under the National Historic Preservation Act. Prior to ground disturbance, land transfer projects, or management activities, cultural resource inventories shall be completed using the latest protocols.
- HC-S-05** Timber harvest activities can be used to meet tribal values, including restoration of healthy ecosystems or providing cultural and heritage needs for the corridor. This management area is not suitable for timber production.
- HC-S-06** Wildfire suppression activities will be undertaken in accordance with the latest Fire Suppression Planning and Operations Guide for the Trail of Tears and Unicoi Turnpike Corridor to protect the integrity of the Heritage Corridor trail bed and all entrenched sections, all associated archeological or cultural resource sites, and interpretive signage.
- HC-S-07** Allow no activities, including mineral collection, rock hounding or mineral leasing surface occupancy, that would adversely impact tribal traditional cultural properties and ceremonial and sacred sites.
- HC-S-08** Maintain confidentiality of culturally significant tribal landscapes to Native American tribes, traditional areas, and sacred sites.
- HC-S-09** Locate and design interpretive developments and public education efforts related to trail history and culture in formal consultation with all parties.
- HC-S-10** Exceptions to these above standards can be made to address tribal interests, human health and safety or emerging resource needs following consultation with tribes, NPS, ACHP and SHPO.
- HC-S-11** Management of Inventoried Roadless Areas (IRA) within the Heritage Corridors management area shall conform to IRA management direction in Backcountry management area in addition to Heritage Corridors management area direction. Where Heritage Corridors management area direction differs from IRA direction for roads or vegetation management, the more restrictive direction applies.

## Guidelines

- HC-G-01** In-place protection and preservation of identified associated significant sites and intact trail segments is the preferred management.

- HC-G-02** Unless necessary to protect or benefit cultural or natural resources, roads and trails should not be maintained or reconstructed outside of their existing prism, and existing utilities (powerlines, pipelines, etc.), trenches, crossings, and prescribed fire lines shall be utilized rather than disturbing new ground.
- HC-G-03** Views from the National Historic Trails and associated sites should be analyzed during reviews of proposed activities or projects within the corridors to avoid adverse visual impacts.
- HC-G-04** Archeological investigations should be conducted in coordination with tribal management recommendations. Where cultural resources are present, document locations and conditions through formal consultation with all parties.

### **Management Approaches**

All parties, including Forest Service, Federally Recognized Native American tribes, SHPO, National Park Service (NPS), and other associations, will be invited to collaborate in the development, design, and determination of management activities within the corridor to meet preservation, protection, restoration, and interpretation needs. NEPA scoping documents for all activities proposed with this management area will be sent to all consulting parties. Copies of the project scoping notices sent to tribes will be sent to all THPOs and include existing cultural resources data and summarized historic overviews pertaining to the project area.

Meet with interested tribal leaders at least every other year to discuss management of the Trail of Tears and opportunities for the future.

Upon renewal or reissuance, all land use permits, contracts, and other Forests use authorizations contain stipulations and provisions for protection of heritage corridors. SHPO and ACHP consultation will follow direction found in the latest NFsNC section 106 Programmatic Memorandum of Agreement.

Inadvertent discoveries and emergency discoveries are reported to and mitigation is developed through consultation with SHPO, tribes, THPOs, and ACHP.

Signage and interpretive plans are developed for the corridors in consultation with all parties to determine appropriate locations, messages, and designs.

Cultural Landscape Inventories are completed and document the locations and conditions (integrity) of the UT, Trail of Tears, and OMVT. Inventories will aid in the establishment of boundaries, landscape type, associated resources, and evaluation for NRHP eligibility and would provide the baseline data needed to prepare a Cultural Landscape Report (CLR).

Through the Cultural Landscape Inventory for the Trail of Tears and Unicoi Turnpike additional removal routes may be identified. These newly identified removal routes will be considered, through consultation, for addition to the Heritage Corridor Management Area.

Work with the NC Wildlife Resources Commission in the stocking of fishing for recreation and management of wildlife fields.

Use the latest Regional Programmatic Agreement on Managing the Trail of Tears.

**See also:** Tribal Resources, Cultural Resources

## Management Area: Wild and Scenic Rivers

### Background

This management area includes management direction for Wild and Scenic Rivers and the adjacent lands that make up the river corridors on NFS lands. The Wild and Scenic Rivers Act (Public Law 90-542: 16 USC 1271-1287, October 2, 1968) and its amendments provide for the protection of selected rivers and their immediate environments. Congressionally designated Wild and Scenic Rivers are managed to maintain the free-flowing status, to maintain Outstanding Remarkable Values (ORVs), and maintain or enhance the wild, scenic, and riparian features of the river and to provide water-oriented recreational opportunities in a natural setting. Rivers that are eligible for Wild and Scenic River designation are afforded a set of interim protections to assure that the free-flowing characteristics and the ORVs are maintained until a decision is made on the future use of the river and adjacent lands through an Act of Congress or a change in eligibility or suitability status from a future study.

Designated and eligible Wild and Scenic Rivers are listed in tables 15 and 16, which identify the river segment as well as the identified ORVs and the classification associated with the river segments.

**Table 14. Congressionally Designated Rivers**

River Name	Description	Outstandingly Remarkable Values
<b>Chattooga River*</b>	A total of 9.7 miles in North Carolina from 0.8 miles below Cashiers Lake to the Georgia/South Carolina line with the following river classifications: - Recreational (5.5 miles): From 0.8 miles below Cashiers Lake to 0.2 miles above Norton Mill Creek; - Wild (2.0 miles): From 0.2 miles above Norton Mill Creek to 0.25 miles above Bullpen Bridge; - Scenic (0.5 miles): From 0.25 miles above Bullpen Bridge to 0.25 miles below Bullpen Bridge; - Wild (1.7 miles): From 0.25 miles below Bullpen Bridge to the Georgia/South Carolina line.	<ul style="list-style-type: none"> <li>• Scenery</li> <li>• Recreation</li> <li>• Geology</li> <li>• Cultural/Historical</li> <li>• <b>Biological</b></li> </ul>
<b>Horsepasture River</b>	A total of 4.2 miles from NC281 to Lake Jocassee with the following classifications: - Recreational (0.6 miles): From NC281 to the base of Drift Falls; - Scenic (3.6 miles): From the base of Drift Falls to Lake Jocassee.	<ul style="list-style-type: none"> <li>• Scenery</li> <li>• Recreation</li> <li>• Geology</li> <li>• Ecology/Botanical</li> </ul>
<b>Wilson Creek</b>	A total of 23.3 miles from the headwaters below Calloway Peak to the confluence of Johns River with the following classifications: - Scenic (2.9 miles): From the headwaters below Calloway Peak to the confluence of Little Wilson Creek; - Wild (4.6 miles): From the confluence of Little Wilson Creek to the confluence of Crusher Branch; - Recreational (15.8 miles): From the confluence with Crusher Branch to the confluence of Johns River.	<ul style="list-style-type: none"> <li>• Scenery</li> <li>• Recreation</li> <li>• Geology</li> <li>• Fish</li> <li>• Wildlife</li> <li>• Ecology/Botanical</li> <li>• Cultural/Historical</li> </ul>

\*Denotes river segments within North Carolina only

**Table 15. Eligible or Suitable Rivers**

<b>River Name</b>	<b>Description</b>	<b>Outstandingly Remarkable Values</b>
<b>Big Laurel Creek</b>	<p>A total of 2.8 miles of Big Laurel Creek on National Forest System lands from the Forest Service property line near US25 to the confluence with the French Broad River was determined to be eligible with the following river classifications:</p> <ul style="list-style-type: none"> <li>- Recreational for the entire segment.</li> </ul> <p>Additional segments of Big Laurel Creek and Puncheon Fork on private lands upstream of National Forest lands were also identified as eligible in the 1987 evaluation. However, the analysis found that no segments of Big Laurel Creek or Puncheon Fork were suitable for designation.</p>	<ul style="list-style-type: none"> <li>• Scenery</li> <li>• Recreation</li> <li>• Fish</li> <li>• Cultural/Historical</li> </ul>
<b>Cullasaja River</b>	<p>A total of 7.8 miles of the Cullasaja River on National Forest lands from the Forest Service property line below Lake Sequoyah Dam to the Forest Service property line upstream of Buck Creek confluence were determined to be eligible with the following river classifications:</p> <ul style="list-style-type: none"> <li>- Recreational for the entire segment.</li> </ul> <p>Further study is deferred.</p>	<ul style="list-style-type: none"> <li>• Scenery</li> <li>• Recreation</li> <li>• Geology</li> <li>• Ecology/Botanical</li> </ul>
<b>Davidson River</b>	<p>A total of 10.9 miles of the Davidson River on National Forest lands from the confluence of Daniel Ridge Creek and Right Fork to the Forest Service property line east of Sycamore Flats were determined to be eligible with the following river classifications:</p> <ul style="list-style-type: none"> <li>- Recreational for the entire segment.</li> </ul> <p>Additional river segments on private lands downstream of Sycamore Flats were also identified as eligible in the 1987 evaluation. However, the analysis found that no segments of the Davidson River were suitable for designation.</p>	<ul style="list-style-type: none"> <li>• Fish</li> <li>• Cultural/Historical</li> </ul>
<b>East Fork Pigeon River, Yellowstone Prong, and Dark Prong</b>	<p>A total of 9.8 miles of Yellowstone Prong, Dark Prong, and East Fork Pigeon River on National Forest lands from their headwaters to US276 were determined to be eligible with the following classifications:</p> <ul style="list-style-type: none"> <li>- Scenic (3.1 miles): Yellowstone Prong from the headwaters to the confluence with East Fork Pigeon River;</li> <li>- Wild (2.6 miles): Dark Prong from the headwaters to the confluence with East Fork Pigeon River;</li> <li>- Wild (4.1 miles): East Fork Pigeon River from confluence of Dark Prong and Yellowstone prong to US276.</li> </ul> <p>These river segments were found to be potentially suitable for designation in the 1987 evaluation. Further study was deferred.</p>	<ul style="list-style-type: none"> <li>• Scenery</li> <li>• Fish</li> <li>• Wildlife</li> <li>• Cultural/Historical</li> </ul>

River Name	Description	Outstandingly Remarkable Values
<b>Fires Creek</b>	<p>A total of 2.8 miles of Fires Creek on National Forest lands from the confluence of Bee Branch to the Forest Service property line downstream of Fires Creek Picnic Area were determined to be eligible with the following river classification:</p> <ul style="list-style-type: none"> <li>- Recreational for the entire segment.</li> </ul> <p>Further study is deferred.</p>	<ul style="list-style-type: none"> <li>• Fish</li> </ul>
<b>Flat Laurel Creek</b>	<p>A total of 1.7 miles of Flat Laurel Creek on National Forest lands were determined to be eligible with the following river classifications:</p> <ul style="list-style-type: none"> <li>- Scenic (1.4 miles): From the headwaters to the eligible West Fork Pigeon River corridor;</li> <li>- Recreational (0.3 miles): From the corridor of West Fork Pigeon River to the confluence with that river. (West Fork Pigeon River is also classified as Recreational, so this classification is consistent for both rivers in the overlapping corridors).</li> </ul> <p>Further study is deferred.</p>	<ul style="list-style-type: none"> <li>• Ecology/Botanical</li> </ul>
<b>French Broad River</b>	<p>A total of 1.9 miles of the French Broad River on National Forest lands between Barnard, NC and the Tennessee line were determined to be eligible with the following river classification:</p> <ul style="list-style-type: none"> <li>- Scenic for the entire segment.</li> </ul> <p>Additional river segments on private lands from Asheville to Barnard, NC were also identified as eligible in the 1987 evaluation. However, the analysis found that no segments of the French Broad River were suitable for designation.</p>	<ul style="list-style-type: none"> <li>• Scenery</li> <li>• Geology</li> <li>• Fish</li> <li>• Ecology/Botanical</li> <li>• Cultural/Historical</li> </ul>
<b>Linville River</b>	<p>A total of 14 miles of the Linville River from the northern to the southern boundary of Linville Gorge Wilderness were determined to be eligible with the following river classification:</p> <ul style="list-style-type: none"> <li>- Wild for the entire segment.</li> </ul> <p>Additional river segments on private lands upstream and downstream of Linville Gorge Wilderness were also identified as eligible in the 1987 evaluation. The analysis found a segment of the river through NPS BRP lands and Linville Gorge Wilderness to be potentially suitable for designation. Further study was deferred.</p>	<ul style="list-style-type: none"> <li>• Scenery</li> <li>• Geology</li> <li>• Fish</li> <li>• Wildlife</li> <li>• Cultural/Historical</li> </ul>
<b>*Mills River System</b>	<p>A total of 23.1 miles of North Fork Mills River and South Fork Mills River on National Forest lands were determined to be eligible with the following river classifications:</p> <ul style="list-style-type: none"> <li>- Recreational (3.5 miles): North Fork Mills River from spillway of Hendersonville Reservoir to Forest Service property line near confluence of Wash Creek, and from Forest Service property line near confluence of Rocky Fork to Forest Service property</li> </ul>	<ul style="list-style-type: none"> <li>• Scenery</li> <li>• Recreation</li> <li>• Fish</li> <li>• Wildlife</li> <li>• Ecology/Botanical</li> <li>• Cultural/Historical</li> </ul>



River Name	Description	Outstandingly Remarkable Values
	<p>line at confluence of Rush Branch;</p> <p>- Scenic (4.2 miles): South Fork Mills River from confluence of Pigeon Branch to confluence of Billy Branch downstream of concrete bridge.</p> <p>- Wild (15.4 miles): South Fork Mills River from the confluence of Billy Branch to the National Forest property line downstream of Bradley Creek confluence;</p> <p>Additional segments of North Fork Mills River, South Fork Mills River, and Mills River on private lands or partly on National Forest lands were also identified as eligible in the 1987 evaluation. The analysis found segments of the Mills River System to be potentially suitable for designation. Further study was deferred.</p>	
<b>Nantahala River</b>	<p>A total of 17.2 miles of the Nantahala River on National Forest lands above and below Nantahala Lake were determined to be eligible with the following river classifications:</p> <p>- Recreational (9.8 miles): From the headwaters in Standing Indian Basin to the slack water of Nantahala Lake;</p> <p>- Recreational (7.4 miles): From the Nantahala River powerhouse near Nantahala Lake to Lake Fontana.</p> <p>Additional segments of the Nantahala River on private lands or partly on National Forest lands above and below Nantahala Lake were also identified as eligible in the 1987 evaluation. The analysis found segments of the river to be potentially suitable for designation. Further study was deferred.</p>	<ul style="list-style-type: none"> <li>• Scenery</li> <li>• Recreation</li> <li>• Geology</li> <li>• Fish</li> <li>• Wildlife</li> <li>• Ecology/Botanical</li> <li>• Cultural/Historical</li> </ul>
<b>**Nolichucky River</b>	<p>The Nolichucky River is a congressionally designated study river with a total of 6.0 miles on National Forest lands from the railroad bridge at Poplar, NC to the Tennessee line with the following river classification:</p> <p>- Scenic for the entire segment.</p> <p>This river segment was found to be suitable for designation in 1991.</p>	<ul style="list-style-type: none"> <li>• Scenery</li> <li>• Geology</li> <li>• Fish</li> </ul>
<b>North Fork French Broad River</b>	<p>A total of 3.2 miles of the North Fork French Broad River from the confluence of Big Mountain Branch downstream to the USFS boundary near the NC215/SR1329 intersection in Rosman were determined to be eligible with the following river classification:</p> <p>- Recreational for the entire segment.</p> <p>Further study is deferred.</p>	<ul style="list-style-type: none"> <li>• Recreation</li> </ul>
<b>Santeetlah Creek</b>	<p>A total of 12.5 miles of Santeetlah Creek on National Forest lands from the headwaters to the confluence with an unnamed tributary upstream of Rattler Ford Campground were determined to be eligible with the following river classification:</p>	<ul style="list-style-type: none"> <li>• Fish</li> <li>• Wildlife</li> <li>• Ecology/Botanical</li> <li>• Cultural/Historical</li> </ul>

River Name	Description	Outstandingly Remarkable Values
	<p>- Scenic for entire segment.</p> <p>Further study is deferred.</p>	
<b>Snowbird Creek</b>	<p>A total of 12.7 miles of Snowbird Creek on National Forest lands were determined to be eligible with the following river classifications:</p> <p>- Wild (8.6 miles): From the headwaters near Mitchell Lick to the confluence of Owlcamp Branch;</p> <p>- Scenic (4.1 miles): From the confluence of Owlcamp Branch to the confluence of Polecat Branch.</p> <p>Additional segments of Snowbird Creek on private lands or partly on National Forest lands were also identified as eligible in the 1987 evaluation. The analysis found segments of the Snowbird Creek to be potentially suitable for designation. Further study was deferred.</p>	<ul style="list-style-type: none"> <li>• Scenery</li> <li>• Fish</li> <li>• Cultural/Historical</li> </ul>
<b>South Toe River</b>	<p>A total of 3.7 miles of the South Toe River on National Forest lands from the confluence of Left Prong South Toe River to the bridge at Black Mountain Campground were determined to be eligible with the following river classification:</p> <p>- Recreational for entire segment.</p> <p>Further study is deferred.</p>	<ul style="list-style-type: none"> <li>• Recreation</li> </ul>
<b>Tellico River</b>	<p>A total of 6.0 miles of the Tellico River on National Forest lands from the headwaters to the Tennessee line were determined to be eligible with the following river classification:</p> <p>- Recreational for the entire segment.</p> <p>Further study was deferred.</p>	<ul style="list-style-type: none"> <li>• Fish</li> <li>• Wildlife</li> </ul>
<b>Thompson River</b>	<p>A total of 3.7 miles of the Thompson River on National Forest lands were determined to be eligible with the following classifications:</p> <p>- Scenic (0.4 miles): From the headwaters to the Forest Service property line west of SR1152;</p> <p>- Recreational (1.0 miles): From the Forest Service property line west of NC281 to Forest Service property line east of NC281;</p> <p>- Scenic (2.3 miles): From the Forest Service property line east of NC281 to the Forest Service property line east of Long Spur Ridge.</p> <p>Further study is deferred.</p>	<ul style="list-style-type: none"> <li>• Scenery</li> <li>• Recreation</li> </ul>
<b>West Fork Pigeon River</b>	<p>A total of 7.0 miles of the West Fork Pigeon River on National Forest lands from the confluence of Bubbling Spring Branch to the confluence of Queen Creek were determined to be eligible with the following river classification:</p>	<ul style="list-style-type: none"> <li>• Scenery</li> <li>• Recreation</li> <li>• Ecology/Botanical</li> </ul>

River Name	Description	Outstandingly Remarkable Values
	- Recreational for the entire segment. Further Study is deferred.	
<b>Whitewater River</b>	A total of 3.6 miles of the Whitewater River on National Forest lands from the Forest Service property line upstream of the confluence with Democrat Creek to the South Carolina line were determined to be eligible with the following river classification:  -Scenic for the entire segment.  Further study is deferred.	<ul style="list-style-type: none"> <li>• Scenery</li> <li>• Recreation</li> <li>• Geology</li> <li>• Ecology/Botanical</li> </ul>

\*Denotes rivers which have been designed by Congress as a study river. River management under this designation is the same as that of an eligible river.

\*\*Denotes rivers which have been determined to be suitable for inclusion into the National Wild and Scenic River System.

## Management Applicable for Designated and Eligible/Suitable Rivers

The following plan components apply to each identified river segment regardless of any other forestwide or overlapping management area direction. However, if other overlapping direction is more restrictive, that direction takes precedence.

### Desired Conditions

- WSR-DC-01** The free-flowing character of river segments is maintained without impoundments or diversions.
- WSR-DC-02** The identified Outstandingly Remarkable Values identified above are maintained for each identified river segment according to the river segments Wild and Scenic River classification.
- WSR-DC-03** The desired recreation settings range from primitive in segments classified as Wild to semi-primitive non-motorized or roaded natural on scenic or recreational segments. A variety of dispersed and developed recreational opportunities are available with typical uses including canoeing, fishing, hiking, kayaking, outfitting and guide use, and wildlife viewing.
- WSR-DC-04** **Wild classified river segments** are essentially primitive with little or no evidence of human activity. Most visitors enjoy recreation activities without seeing many other visitors; however, the presence of a few inconspicuous structures, particularly those of historic or cultural value, may occur. The area is generally inaccessible, except by trail, with limited vehicular travel within the river corridor; however, a few existing system roads may be present. Disturbance is primarily caused by natural processes, except in the form of prescribed fire, control activities to address pest outbreaks, trails, and river access facilities.
- WSR-DC-05** **Scenic classified river segments** are mostly undeveloped; however, there may be occasional roads and/or bridges adjacent or crossing the river; designated parking areas; and trailheads. Visitors enjoy a natural setting, although the sights and sounds of other

visitors and civilization may be present. The area may be accessible in places by road, and roads may occasionally reach or bridge the river. Disturbance is primarily caused by natural processes, and the landscape is mostly natural; however, both natural and human disturbance may be visible. Evidence of past or ongoing management activities, including timber harvest, is acceptable provided the forest appears natural from the riverbank.

**WSR-DC-06** **Recreational classified river segments** may contain substantial evidence of human activity including residential and/or commercial structures. Visitors enjoy a wide variety of recreational activities in a natural setting; however, sights and sounds of other visitors may be present. Non-motorized trails may be highly visible and be highly developed with facilities such as parking areas and restrooms. Rivers are readily accessible by roads or railroads with the existence of parallel roads or railroads on one or both banks as well as bridge crossings and other river access points being present. The landscape is natural; however, both natural and human disturbance may be visible. Adjacent lands may be developed for the full range of agricultural and forestry uses and may show evidence of past and ongoing timber harvest.

**WSR-DC-07** Existing wildlife fields and linear wildlife habitats are sustained provided they do not compromise an Outstandingly Remarkable Value associated with the corridor. Some openings may provide more shrub/sapling habitat as a result of longer maintenance cycles.

**WSR-DC-08** The desired scenic character is natural evolving in river segments classified as Wild; natural evolving to natural appearing in segments classified as Scenic; and natural-appearing, rural forested or pastoral in segments classified as Recreational; and cultural/historic elements may be present in any WSR classification.

*Additional desired conditions specific to Eligible and/or Suitable Wild and Scenic Rivers or Congressionally Designated Rivers are further below.*

## Standards

**WSR-S-01** Dams or other man-made structures that impede the flow of the river are prohibited.

**WSR-S-02** Creation of brushy interface adjacent to or expansion of existing wildlife fields and linear wildlife openings shall not compromise an Outstandingly Remarkable Value associated with the corridor.

**WSR-S-03** Construction of new permanent wildlife fields and linear wildlife habitats shall not compromise an Outstandingly Remarkable Value associated with the corridor.

*Additional standards specific to Eligible and/or Suitable Wild and Scenic Rivers or Congressionally Designated Rivers are detailed below.*

## Eligible and/or Suitable Wild and Scenic Rivers

The management direction below is unique to currently “Eligible” or “Suitable” Wild and Scenic Rivers on the Nantahala and Pisgah National Forests regardless of their management area. This management direction would also apply to any rivers which are identified as “Eligible” or “Suitable” in the future.

## Desired Conditions

- WSR-DC-09** Proposed actions are designed to meet or exceed the following desired SIOs on lands inventoried as the corresponding scenic classes:

### Eligible, Suitable Wild and Scenic Rivers Management Area

Inventoried Scenic Class	Desired Scenic Integrity Objective
All scenic classes	<ul style="list-style-type: none"> <li>• Very High SIO for corridor of segments classified as Wild</li> <li>• High SIO for corridor of segments classified as Scenic</li> <li>• Moderate SIO for corridor of segments classified as Recreational</li> </ul>

## Standards

- WSR-S-04** Until designation decisions are made, management projects and activities shall not reduce the characteristics of the rivers and adjacent lands within a ¼ mile on either side of the river segment (river corridor) such that the rivers no longer qualify for their identified classification as “Wild,” “Scenic,” or “Recreational.”

## Soil and Water

### Standards

- WSR-S-05** The river and its channel are not modified except for riparian or habitat improvements. Some activities related to management of riparian dependent resources or wildlife habitat activities may be evident. Stream restoration, river enhancements, and/or improvements to the free-flowing character are permissible such that they do not adversely impact the Outstandingly Remarkable Values associated with each river segment.
- WSR-S-06** Any proposed water resource projects within river segments shall be analyzed as their effect on a river’s free flowing character, water quality, and Outstandingly Remarkable Values with adverse effects to be prevented to the extent of existing agency authorities.

## Silvicultural Practices, Including Timber, Fire, and Vegetation Management

### Standards

- WSR-S-07** **Within Recreation and Scenic classified segments**, silvicultural practices are allowed provided that such practices are carried out in such a way that there is no substantial adverse effect on the river and its immediate environment and the desired SIO can be met.
- WSR-S-08** **Within Wild classified segments**, timber production is not permitted.

- WSR-S-09**     **Within Wild classified segments**, timber harvest is not allowed unless it provides for user safety or enhancement/protection of Outstandingly Remarkable Values.

#### **Guidelines**

- WSR-G-01**     Wildland fires may be used to restore and maintain the historic fire regime.
- WSR-G-02**     **Within Wild classified river segments**, prescribed burning and wildfires are managed to meet resource objectives and may be used to restore or maintain habitat for threatened and endangered species, and species of conservation concern or restore the natural range of variability.
- WSR-G-03**     Integrated pest management favoring biological controls may be used to eradicate or suppress non-native invasive pests.
- WSR-G-04**     Noncommercial felling of trees may be used to construct and maintain trails.

### **Lands and Special Uses**

#### **Standards**

- WSR-S-10**     Hydroelectric projects are not permitted.
- WSR-S-11**     New public utility rights-of-way are permitted only in the absence of reasonable alternative routes.

#### **Guidelines**

- WSR-G-05**     Issue commercial recreation use permits consistent with capabilities of the area.
- WSR-G-06**     Transmission lines such as gas lines, water pipelines, and similar linear facilities should not be placed within river corridors. If no reasonable alternative exists, restrict the development to existing rights of way, or if new rights of way are needed, evaluate the project in relation to the effect of the project on the classification and ORVs.

### **Facilities**

#### **Standards**

- WSR-S-12**     Allow new facility construction only for the purpose of increasing capacity needs and protection of both natural resources and cultural resources provided there is no substantial adverse effect on the river and its immediate environment.
- WSR-S-13**     **Within Scenic classified segments**, all facilities must be located and designed to harmonize the natural and cultural settings of the river corridor and be screened from view from the river to the extent possible.
- WSR-S-14**     **Within Wild classified segments**, major facilities such as developed campground and interpretive centers are not allowed.

## Guidelines

- WSR-G-07** Expansion or renovation of existing facilities will be considered before development of new facilities.
- WSR-G-08** **Within Scenic classified segments**, emphasis on facilities is on health, safety, and resource protection plus some degree of user convenience.
- WSR-G-09** **Within Recreation and Scenic classified segments**, facilities such as moderate-size campgrounds, convenience facilities, public information centers, or river access developments may be provided as long as they maintain the river's free flowing condition and Outstandingly Remarkable Values.
- WSR-G-10** **Within Wild classified segments**, minimum facilities such as toilets may be provided, if necessary, to protect and enhance water quality, Outstandingly Remarkable Values, and do not adversely impact or degrade these values.

## Transportation and Access

### Standards

- WSR-S-15** Maintain and construct trails consistent with river classification.
- i. Wild – Maintenance Levels 1-3
  - ii. Scenic – Maintenance Levels 2-3
  - iii. Recreational – Maintenance Levels 3-5
- WSR-S-16** **Within Recreation and Scenic classified segments**, road construction or reconstruction including bridges and river access points must maintain the rivers' free flowing condition and Outstandingly Remarkable Values.
- WSR-S-17** **Within Wild classified segments**, motorized travel is not allowed except for administrative use, existing valid legal rights, and for emergency purposes.
- WSR-S-18** **Within Wild classified segments**, new road construction or other facility construction is not permitted.
- WSR-S-19** **Within Wild classified segments**, reconstruction of roads or other facilities is not allowed unless the reconstruction will enhance the Outstandingly Remarkable Value.
- WSR-S-20** **Within Recreation and Scenic classified segments**, new trail or facility construction must be compatible with and fully protect identified values.

### Guidelines

- WSR-G-11** **Within Scenic classified segments**, roads, trails, and dispersed campsites are managed to discourage impacts to lakes, streams, and fragile soil resources.
- WSR-G-12** **Within Wild classified segments**, to preserve the wild, character trails within the river corridor should not allow motorized access, and motorized use should not be permitted.

## Minerals and Energy

### Standards

- WSR-S-21** Leases, licenses, and permits for leasable mineral extraction within the river corridor must include conditions to protect the Outstandingly Remarkable Values and free flowing characteristics.
- WSR-S-22** Manage mineral activities to protect river area values. Conduct only those mineral activities which minimize surface disturbance, sedimentation, pollution, and meet SIOs. Stipulate no surface occupancy in any new leases.
- WSR-S-23** **Within Wild classified segments**, saleable mineral materials may not be developed for sale or used for any projects outside of the river corridor.

### Guidelines

- WSR-G-13** Subject to valid existing rights, locatable mining activity within the river corridor should be conducted to avoid surface disturbance, sedimentation, pollution, and meet SIOs.
- WSR-G-14** Wildlife and fish projects and vegetation management to protect or enhance wildlife and fish habitat should harmonize with the area's intended character and fully protect the ORVs. Any projects that have the potential to affect the river's free-flowing character must be evaluated as water resources project.

## Congressionally Designated Rivers

The management direction below only applies to the Congressionally Designated Wild and Scenic Rivers on the Nantahala and Pisgah National Forests. This management direction would also apply to any future Designated Rivers.

### Desired Conditions Common to all Designated WSRs

- WSR-DC-10** Emphasize river oriented, non-motorized recreation opportunities.
- WSR-DC-11** Provide facilities as needed for public safety, resource protection, and enhancement of the recreational experience.
- WSR-DC-12** Provide access for use and enjoyment of the rivers consistent with the river classification.
- WSR-DC-13** Provide for user comfort, safety, and resource protection.
- WSR-DC-14** Emphasize donation or exchange to acquire public lands within river corridors. Consider scenic easements to protect river values only when acquisition of fee or simple title is improbable.

### Standards Common to all Designated WSRs

- WSR-S-24** Saleable and leasable mineral development is not allowed.
- WSR-S-25** Issue commercial recreation use permits consistent with capabilities of the area.
- WSR-S-26** Primitive camping opportunities within riparian areas are only allowed when compatible with the river's ORVs.



**WSR-S-27** Maintain and construct trails consistent with river classification:

- i. Wild – Maintenance Levels 1-3
- ii. Scenic – Maintenance Levels 2-3
- iii. Recreational – Maintenance Levels 3-5

**Specific Direction for Designated Wild and Scenic Rivers by Name:**

**Chattooga River**

The Chattooga Wild and Scenic River corridor is located within three National Forests. The 57 miles of the river begins in North Carolina (Nantahala National Forest) and continues on to form the state boundary between South Carolina (Sumter National Forest) and Georgia (Chattahoochee National Forest). The three national forest land management plans provide direction for management of the river within their respective forest boundaries. The following management direction is for the segments of the Chattooga River within the Nantahala National Forest with the exception of some visitor capacities listed in the Guidelines management section. The direction in this forest plan combined with the direction provided by the Sumter and Chattahoochee National Forests specific to the Chattooga River constitutes the comprehensive plan as required in the Wild and Scenic Rivers Act (Act) section 3(d)(2).

**Desired Conditions**

- WSR-DC-15** Manage to maintain the unique characteristics and scenic values of the river corridor. <sup>33</sup>
  - i. Meet a SIO of “High.”
  - ii. Meet a SIO of “Very High” where the Ellicott Rock Wilderness overlaps the Wild and Scenic river corridor (from Iron Bridge to the border between North Carolina and South Carolina).
- WSR-DC-16** Provide limited boating opportunities on the upper segment of the Chattooga River.
- WSR-DC-17** Provide facilities as needed for public safety, resource protection, and enhancement of the recreational experience.
- WSR-DC-18** Camping opportunities are primitive and compatible with river values. Redundant campsites, campsites where resource damage cannot be mitigated, and campsites that exacerbate encounters or conflict will be closed or relocated.
- WSR-DC-19** The trail system, including portage trails, is designed to minimize encounters and conflict while being environmentally sustainable. Redundant trails, trails where resource damage cannot be mitigated and trails that exacerbate encounters or conflict will be closed or rerouted.
- WSR-DC-20** Provide parking and trailhead facilities at Grimshawe and the Iron Bridge on the Chattooga River.

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<sup>33</sup> In 1995, the Scenery Management System (SMS) replaced the Visual Management System (VMS). The scenic resource has been re-inventoried to comply with the new terminology and the newer system (see Landscape Aesthetics, A Handbook for Scenery Management, Agricultural Handbook Number 701). This update in language will not result in a change of management direction.

## Standards

- WSR-S-28** Manage the Chattooga River for the river classifications as noted in Table 14.
- WSR-S-29** Provide no opportunities for Off-Highway Vehicles apart from those allowed on system roads.
- WSR-S-30** Manage the entire Chattooga River corridor within the Nantahala National Forest for a Semi-primitive Non-motorized recreation experience.
- WSR-S-31** Floating on the Chattooga River is not allowed upstream of the Highway 28 Bridge, except non-commercial boating is allowed on approximately 17 miles of the 21-mile main stem on National Forest lands from the Green Creek Trail to the Lick Log Access Trail only from December 1 to April 30 by issuance of a self-registration boating permit consistent with 36 C.F.R. §261.77 and with the following conditions:
- Boating is permitted only on a day after the flows reach 350 cfs or greater at the USGS Burrells Ford gauge.
  - Boating is permitted during daylight hours (30 minutes before official sunrise to 30 minutes after official sunset) on that same day.
  - Boaters must use tandem/single-capacity hard boats or tandem/single-capacity inflatable boats.
  - Boaters must complete a permit and must use only the designated put-in or take-out areas identified in the permit.
- The self-registration boating permit will:
1. Specify boater put-ins and take-outs and safety equipment for boaters. (Note: “Designated” or “system” is defined as “Planned, designed and maintained by the U.S. Forest Service.” “Designated put-in” is defined as “A river access point where boaters launch their craft.” “Designated take-out” is defined as “A river access point where boaters take their craft out of the river”).
  2. Require that boating groups be limited to a maximum group size of six people and a minimum group size of two craft.
- WSR-S-32** Boating in the tributaries within the Wild and Scenic River corridor is prohibited.
- WSR-S-33** Commercial boating is prohibited.
- WSR-S-34** Above the Highway 28 Bridge, backcountry group sizes will be limited as follows: maximum 12 people per group on trails; six people per group at designated campsites, except at designated large group campsites; and four people per angling group.
- WSR-S-35** Above the Highway 28 Bridge, large woody debris removal without Agency approval is prohibited.
- WSR-S-36** Above the Highway 28 Bridge, camping is allowed only in designated campsites<sup>34</sup>. Campsites are designed to accommodate no more than three tents per site, except at

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<sup>34</sup>“Designated Campsites” are defined as “Campsites that are planned, designed and maintained to minimize biophysical impacts.”

group designated sites, to limit encounters and conflict, and to be environmentally sustainable. Campfires are allowed only in designated fire rings.

**WSR-S-37** Above the Highway 28 Bridge, and within the river corridor, recreation users stay on designated trails.<sup>35</sup>

**WSR-S-38** Provide parking and trailhead facilities at Grimshawe and the Iron Bridge on the Chattooga River.

## Guidelines

Use the following guidelines in managing the upper Chattooga River. (Note: A “guideline” is defined as “a generally preferred or advisable course of action or level of attainment designed to promote achievement of goals or objectives.”):

**WSR-G-15** Above the Highway 28 Bridge, the visitor capacities in Table 16 and Table 17 should not be exceeded.

**Table 16. Capacities in Four Frontcountry Areas in the Upper Segment of the Chattooga WSR**

Frontcountry Areas	Groups at One Time <sup>1</sup>	People at One Time
Grimshawes/Sliding Rock Bridge	25	65
Bullpen Road Bridge Area	15	40
Burrells Fore Bridge Area	80	205
Highway 28 Bridge Area	35	85

<sup>1</sup>The number of groups at one time equals the number of designated parking spaces in each frontcountry area. (Note: “Frontcountry” is defined as “An area that lies within one-quarter mile of roads and bridges. These areas offer easy access to the National Forest where visitors are more tolerant of interaction with others as long as at-one-time use does not overwhelm the natural setting or create high levels of crowding and congestion.”)

**Table 17. Capacities in Four Backcountry Reaches in the Upper Segment of the Chattooga WSR**

Backcountry Reach	Average Groups per Weekday	Average People per Weekday <sup>2</sup>	Average Groups per Weekend Day	Average People per Weekend Day <sup>2</sup>
Chattooga Cliffs	5	10	10	15
Ellicott Rock	10	35	20	110
Rock Gorge	15	40	30	95
Nicholson Fields	15	40	30	95

<sup>35</sup>“Designated trails” are defined as “Trails that are planned, designed, and maintained to minimize biophysical impacts.”

<sup>2</sup>Average number of people per group varies by reach. (Note: “Backcountry” is defined as “An area that lies beyond one-quarter mile of roads and bridges. In these areas, visitors are more interested in opportunities that feature solitude, self-reliance, a sense of remoteness, and a primitive setting.”)

## Horsepasture River

In addition to the following management direction, the Horsepasture River National Wild and Scenic River Corridor is also managed under the direction in the Horsepasture River Comprehensive River Management Plan (CRMP), a separate document.

### Desired Conditions

- WSR-DC-21** Manage to maintain the unique characteristics and scenic values of the river corridor.<sup>36</sup>
- i. Meet a Scenic Integrity Objective (SIO) of “Moderate” from the National Forest boundary below Drift Falls to Rainbow Falls.
  - ii. Meet a SIO of “High” from base of Rainbow Falls to the National Forest boundary

### Standards

- WSR-S-39** Manage the River corridor:
- i. From the National Forest boundary below Drift Falls to Rainbow Falls as Roaded-Natural; and
  - ii. From the base of Rainbow Falls to the National Forest boundary for a semi-primitive non-motorized recreation experience.
- WSR-S-40** Issues no commercial permits for floating, canoeing, rafting, or kayaking.
- WSR-S-41** Closed roads are only available for administrative use for emergency purposes and for facility or trail construction and maintenance.

## Wilson Creek

In addition to the following management direction, the Wilson Creek National Wild and Scenic River Corridor is also managed under the direction in the Wilson Creek Comprehensive River Management Plan (CRMP), a separate document.

### Standards

- WSR-S-42** Management of Inventoried Roadless Areas within the Wilson Creek WSR corridor shall conform to IRA management direction in Backcountry MA, in addition to WSR management area direction. Where WSR management area direction differs from IRA direction for roads or vegetation management, the more restrictive direction applies.

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<sup>36</sup>In 1995, the Scenery Management System (SMS) replaced the Visual Management System (VMS). The scenic resource has been re-inventoried to comply with the new terminology and the newer system (see Landscape Aesthetics, A Handbook for Scenery Management, Agricultural Handbook Number 701). This update in language will not result in a change of management direction.

## Desired Conditions

- WSR-DC-22** Manage to maintain the unique characteristics and scenic values of the Wilson Creek WSR corridor.<sup>37</sup>
- i. **Within Wild classified river segments**, meet a SIO of “Very High.”
  - ii. **Within Scenic classified river segments**, meet a SIO of “High.”
  - iii. **Within Recreational classified river segments**, meet a SIO of “High” in Variety Class A landscapes and meet a SIO of “Moderate” in Variety Class B or C landscapes.

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<sup>37</sup>In 1995, the Scenery Management System (SMS) replaced the Visual Management System (VMS). The scenic resource has been re-inventoried to comply with the new terminology and the newer system (see Landscape Aesthetics, A Handbook for Scenery Management, Agricultural Handbook Number 701). This update in language will not result in a change of management direction.

## Management Area: Congressionally Designated Wilderness

### Background

Wilderness is managed to perpetuate or enhance the natural, untrammeled, and undeveloped character of the area while providing opportunities for primitive and unconfined recreation and/or solitude and preserving other features of value such as scenery, geology, or cultural/historic sites. Wilderness is also available for scientific research or educational opportunities which are related to, and compatible with, Wilderness resources and attributes. Designated Wilderness provides for the greatest degree of protection from human intrusion among lands of the Nantahala and Pisgah National Forests. Many acres of Designated Wilderness on the Forests also contain old growth, critical habitats, and natural heritage areas where preservation of natural conditions is favored. As of 2018, Wilderness designations extend to more than 107 million acres nationwide, including approximately 66,388 on the Nantahala and Pisgah National Forests.

There are three Congressionally Designated Wildernesses wholly within the Nantahala and Pisgah National Forests and three Wildernesses which are partly on adjacent National Forests:

**Table 18. Congressionally Designated Wilderness on the Nantahala and Pisgah National Forests**

Wilderness Name	Nantahala-Pisgah NF Acres*	Adjacent NF Acres*	Management Lead	Established / Expanded	Geographic Area(s)
Ellicott Rock	3,394	6,253	Sumter NF	1975 / 1984	Highland Domes
Joyce Kilmer-Slickrock	13,562	3,832	Nantahala NF	1975 / 1984	Unicoi Mountains & Fontana Lake
Linville Gorge	11,786		Pisgah NF	1964 / 1984	Eastern Escarpment
Middle Prong	7,460		Pisgah NF	1984	North Slope
Shining Rock	18,483		Pisgah NF	1964 / 1984	North Slope
Southern Nantahala	11,703	11,770	Nantahala NF	1984	Nantahala Mountains
<b>Total Acres</b>	<b>66,388</b>	<b>21,855</b>			

*\*Acres are approximate.*

In Wilderness, preservation of the natural environment free from human influences predominates. Timber harvest is not utilized as a management tool; however, prescribed fire or wildland fire use may occur where beneficial in maintaining historic fire regimes, perpetuating fire-dependent ecosystems, or reducing fuel loading which may pose a risk to adjacent private lands. Integrated pest management favoring biological controls may occur when used to eradicate or suppress non-native invasive pests. Non-commercial felling of trees with hand tools may also occur when used to construct or maintain trails. Hunting and fishing are permitted consistent with NC state game laws and Wilderness values.

Motorized and mechanized uses are generally prohibited, although exceptions are made in emergency circumstances that threaten human life and safety.<sup>38</sup>

### Desired Conditions

- CDW-DC-01** Preservation of the natural environment free from human influences predominates. The natural, undeveloped, and untrammelled character of Wilderness is preserved or enhanced as are other features of value. With a desired condition of a primitive recreation setting, opportunities for solitude or primitive and unconfined recreation are maintained for visitors to experience. Scientific research or visitor education is conducted when consistent with Wilderness values. Commercial enterprise does not exist within these areas except through permitted outfitter and guide services which allow visitors to experience and be educated about the benefits of Wilderness preservation. Ecological and social characteristics of Wilderness are maintained or enhanced.
- CDW-DC-02** The desired scenic character of these areas is natural evolving and shaped primarily by natural processes, resulting in large patches of late successional and old growth forest conditions. Natural disturbance events, such as insects and diseases, ice storms, and lightning-caused fires, play a role in shaping forest structure, composition, and successional stages across these areas. Non-native vegetation occurs only as transient populations and is not self-perpetuating.
- CDW-DC-03** Natural processes shape habitat and determine the selection, distribution, and population of wildlife species, although the recovery of threatened and endangered species may be promoted. Where present, rare communities and associated species continue to exist. Cavity trees, standing snags, and downed logs are common throughout the area as a result of natural mortality and successional progression.
- CDW-DC-04** Recreation management emphasizes solitude and remoteness in a primitive and natural setting, recognizing that different areas within a Wilderness, or proximity to trailheads, have varying degrees of human use. Access to the area is limited, and use is dispersed through visitor education and trail and trailhead design. Trailheads at surrounding roads are designed with sensitivity to scale and character to set the tone for a primitive recreation experience. Trails, off-trail foot travel, and other forms of primitive recreation provide solitude, physical and mental challenges, a spirit of adventure, and self-reliance. Once in the designated Wilderness, visitors rely on their physical abilities and outdoor skills. Wilderness recreation includes inherent risks, such as adverse weather, isolation, natural physical hazards, or primitive travel. Visitors are isolated from the sights and sounds of others, and encounters with other visitors are rare. Travel within Wilderness is strictly non-motorized and non-mechanized.
- CDW-DC-05** Visitor information is primarily dispensed outside of the Wilderness at trailheads and through off-site public information and education efforts; an exception may be through personal interaction with wilderness rangers. Wilderness visitors are encouraged to "pack it-in and pack-it-out" and to implement "leave no trace" principles. Wilderness

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<sup>38</sup>Use of motorized equipment or mechanized transport is allowed in emergency situations with the appropriate approvals. The National Forests in North Carolina Search and Rescue Policy delegates authority for certain approvals from the forest supervisor to district rangers in emergency situations of inescapable urgency.

trails lie lightly on the land and are typically narrow footpaths or horse trails, with minimum directional signage. Where signs exist, they blend with the natural surroundings. More commonly, there are no directional signs or trail markers, and visitors are challenged by the area's undeveloped character, where skills with map and compass navigation may be required.

- CDW-DC-06** Within these areas, few if any facilities are provided. Permanent human-made shelters or privies only exist along the Appalachian National Scenic Trail. Construction of ANST shelters or privies on new sites within Wilderness is not appropriate unless there is an obvious and overriding need to protect natural resources from visitor impacts. Structures, including trail features, bridges, signs, or constructed water sources for the comfort or convenience of visitors, are minimal. The few structures appearing in Wilderness are generally for the protection of resources or were present prior to Wilderness designation.
- CDW-DC-07** Federal government ownership exists on lands within Wilderness boundaries, both surface and subsurface, with no encumbrances.
- CDW-DC-08** Proposed actions are designed to meet or exceed the following desired SIOs on lands inventoried as the corresponding scenic classes:

**Congressionally Designated Wilderness**

Inventoried Scenic Class	Desired Scenic Integrity Objective
All scenic classes	Very High

**Objectives**

- CDW-O-01** Tier 2: In Wildernesses where use affects opportunities for solitude, conduct a Limits of Acceptable Change analysis or capacity study to assess existing conditions, impacts to solitude, and, if necessary, potential management actions to restore desired conditions.
- CDW-O-02** Tier 2: Establish a baseline inventory of forest communities present in Wilderness in order to more effectively monitor deviations from natural conditions.

**Standards**

- CDW-S-01** With the exception of wheelchairs, motorized equipment and mechanized transport are not allowed, unless determined to be the minimum tool necessary to preserve or enhance wilderness character or in an emergency. Motorized equipment or mechanized transport use authorizations require the appropriate line officer approval following the latest agency policy.
- CDW-S-02** Construct no roads within wilderness.
- CDW-S-03** Manage the trail system for non-motorized and non-mechanized recreation uses consistent with wilderness values.
- CDW-S-04** Limit group size to 10 people in all wildernesses, except Ellicott Rock Wilderness where the group size shall be limited to 12 people. This does not apply to users of the Joyce Kilmer National Recreation Trail.



- CDW-S-05** Installation or replacement of fixed anchors for climbing or similar activities shall only be done following the latest agency policy on climbing and with the appropriate analysis and line officer approval to ensure no ecological or cultural resource damage occurs and that wilderness values are not impacted. If user installation or replacement is approved, anchors shall be of a non-reflective or camouflaged finish. Use of motorized drills is prohibited.
- CDW-S-06** Provide visitor information other than trail signs and personal interactions outside the Wilderness boundary and without advertising or promoting wilderness use. Do not provide information kiosks inside the Wilderness boundary.
- CDW-S-07** Locate trailheads outside the wilderness boundary. Consider effects of location and size on levels and patterns of use within the wilderness.
- CDW-S-08** Other than for outfitter and guide services, issue no permits for special uses such as recreation events. Require outfitters and guides to use “leave no trace” techniques and educate participants in wilderness ethics.
- CDW-S-09** Allow no permanent camps or shelters other than existing Appalachian National Scenic Trail shelters or designated overnight use sites.
- CDW-S-10** Issue permits for scientific research only when it preserves wilderness character, is compatible with wilderness values, and cannot be achieved with similar research opportunities outside Wilderness.
- CDW-S-11** Only allow collection of specimen plants for scientific research with a permit and line officer approval.
- CDW-S-12** Issue no permits for the removal of any forest products and allow collection of plant products only for personal use. Allow collection of dead and down wood only for on-site campfire use.
- CDW-S-13** Issue no permits for military training activities. Discourage military training activities involving overflights within 2,000 feet of ground elevation.
- CDW-S-14** Allow habitat manipulation only to perpetuate the wilderness resource and when essential to the survival or restoration of federally listed threatened or endangered species. Habitat manipulation requires the appropriate analysis and line officer approval.
- CDW-S-15** Stock wildlife only to enhance populations of federally listed threatened or endangered species or to reintroduce species native to the wilderness that were eliminated by human actions, and only when wilderness values are not impaired.
- CDW-S-16** Stock fish only to reestablish or maintain indigenous or native species populations or to restore a federally listed threatened or endangered species. Chemical treatment of waters in preparation for reestablishment of aquatic species is only allowed with appropriate analysis and line officer approval. Normally, use primitive means of stocking.
- CDW-S-17** Use only native materials to revegetate denuded campsites or areas disturbed by wildfire or suppression activities.
- CDW-S-18** The areas are not suitable for timber production or harvest. Allow natural processes to determine the composition and distribution of plant species.

- CDW-S-19** Allow no mining. All minerals under Federal ownership have been withdrawn from mining. These areas are not available for collection of mineral materials for commercial, personal, or free use purposes.
- CDW-S-20** Allow routine aerial detection for wildfires.
- CDW-S-21** Make fire suppression decisions with consideration for life and safety, adjacent lands and properties, wilderness values and resources, suppression costs, natural barriers, and the anticipated path of fire spread.
- CDW-S-22** Use minimum suppression techniques to create the least detriment to Wilderness character unless the fire is threatening public safety within the wilderness or property or resources outside the wilderness.
- CDW-S-23** Allow prescribed fire to reduce a buildup of fuels or to decrease the risks and consequences of wildland fire escaping from the area. The use of natural fire breaks such as streams, roads, and bare areas is encouraged to minimize fire line construction. Proposals must undergo a minimum requirements analysis and have line officer authorization consistent with the latest agency policy.
- CDW-S-24** Permit emergency rehabilitation of a burned area only if necessary to prevent an unnatural loss of wilderness resources or to protect resources outside the Wilderness. Use only native plant species or seed for restoration and stabilization. Normally, use only hand tools, but aerial seeding is allowed with regional forester approval.
- CDW-S-25** In **Linville Gorge Wilderness**, require visitor permits for overnight stays during peak use periods.
- CDW-S-26** Along the **Appalachian National Scenic Trail** segments within wilderness:
1. Follow normal protocol for requested use of aircraft, motorized equipment, or mechanized transport. No special exceptions to prohibited uses shall be granted for maintenance of the Appalachian National Scenic Trail or its facilities unless it is the minimum tool necessary to preserve or enhance wilderness character. Authorizations require appropriate analysis and line officer approval.
  2. Existing Appalachian National Scenic Trail shelters and associated facilities located within wilderness may be maintained, improved, replaced in-kind, or removed. However, if replacement of structures is necessary, consider relocating them outside wilderness boundaries.
  3. Blazing and minimal signage is allowed on the Appalachian National Scenic Trail.
  4. Construct, relocate, and maintain the Appalachian National Scenic Trail to the minimum standard necessary for protection of the soil, water, vegetation, visual quality, user safety, and long-term sustainability. Emphasize trail design that appears to be part of the Wilderness environment and not an intrusion upon it.
- CDW-S-27** In newly designated wilderness:
1. Close all existing roads and evaluate need for rehabilitation. Favor natural revegetation of decommissioned roads. Plant with native species only if the area is not expected to revegetate naturally in a reasonable manner.
  2. Allow wildlife openings to grow up naturally.
  3. Phase out existing incompatible permits.

## Guidelines

- CDW-G-01** In determining appropriate activities for wilderness, give highest priority to uses which least alter or are most dependent upon the wilderness environment.
- CDW-G-02** Maintain soils in a natural undisturbed state, except for trail construction and maintenance, approved watershed restoration projects, wildfire control measures, and campsite rehabilitation. Favor natural healing of disturbed sites.
- CDW-G-03** Maintain all water resources without developed improvements, impoundments, or other modifications, with the exception of the existing water system for the Joyce Kilmer Picnic Area, which may remain in the wilderness and be maintained for continued use.
- CDW-G-04** Construct and maintain trails to minimum standards necessary for protection of the soil, water, vegetation, visual quality, user safety, and long-term sustainability (Trail Class 1 or 2, except Joyce Kilmer National Recreation Trail). Construct and maintain trails with non-motorized equipment unless authorized by the regional forester to use motorized equipment.
- CDW-G-05** To preserve pathfinding as a skill needed in the wilderness experience, minimum trail signage and blazing should be used. Signing should use only names, not mileages or directional arrows. Trails should be blazed only if the trail route cannot be distinguished on the ground or if needed to avoid a safety hazard. Traditional paint blazes should be used on the Appalachian Trail and side trails in the Southern Nantahala Wilderness or any newly designated Wildernesses through which it passes.
- CDW-G-06** Provide foot logs or bridges only when absolutely necessary for protection of streambanks. Consider relocating the trail to a suitable natural crossing before constructing a footbridge. Where necessary, bridges should utilize a design and materials consistent with a primitive recreation setting.
- CDW-G-07** Allow insects and disease to follow their natural course in the wilderness ecosystem unless non-native pests pose a threat to wilderness character. When there is potential for non-native invasive plant species to spread within or across wilderness boundaries, manual methods of treatment are allowed in wilderness with appropriate line officer approval.

## Management Approaches

When planning resource activities adjacent to wilderness while meeting objectives of adjacent management areas, recognize and consider Wilderness values.

Periodically review and update the forest supervisor-approved Search and Rescue Policy and agreements with county emergency services for response protocol in wilderness including appropriate use of motorized equipment and mechanized transport for emergencies involving inescapable urgency.

Manage sections of trails that leave wilderness and pass through other management areas according to the standards of that management area.

Naturalize campsites in trail-less areas and naturalize or rehabilitate trail-side campsites where resource damage or impacts to Wilderness character are occurring. Consider temporary or permanent site closures when other management techniques are not successful.

When the concentration or expansion of user-created campsites affects wilderness character, or natural or cultural resources, close and rehabilitate campsites using appropriate and currently accepted techniques.

Establish or expand permit systems based on existing or anticipated use, if necessary, to preserve wilderness character.

In visitor information and education, convey the concept that wilderness is primitive and rugged, and that certain outdoor skills are necessary for using these areas. Seek visitor self-monitoring for compliance with guidelines to minimize resource impact. Educate visitors about Wilderness values, ethics, and “leave no trace” techniques by implementing priority elements of Wilderness Education Plans. Educate and encourage visitors not desiring or unprepared for a Wilderness experience to use other areas of the Forests. Periodically review and update forest supervisor-approved Wilderness Education Plans.

Redistribute outfitter and guide use to non-wilderness areas when such use conflicts with preservation of Wilderness character.

Retain structures deemed necessary to support public or administrative purposes of wilderness. Remove structures that do not qualify for the National Register of Historic Places or allow them to deteriorate naturally.

Unmanned aircraft systems (drones) are considered motorized equipment and prohibited from landing or taking off from wilderness.

Coordinate with program managers of the Cherokee, Chattahoochee, and Sumter National Forests for respective management of Joyce Kilmer-Slickrock, Southern Nantahala, and Ellicott Rock Wildernesses to ensure wilderness character of these jointly managed areas is perpetuated or enhanced.

Continue partnerships with wilderness stewardship organizations for management of wilderness resources.

In Linville Gorge Wilderness, periodically review effectiveness of the permit system in maintaining opportunities for solitude and minimizing Wilderness resource impacts from camping. If needed, adjust seasons or days when overnight permits are required, or modify implementation methods, required entry points, etc. to more effectively preserve or enhance Wilderness values.

Allow high-density day use of the Joyce Kilmer National Recreation Trail, and manage for a Trail Class appropriate to protect resources at peak use levels.

Allow lightning-caused fires to burn in wilderness when of benefit to threatened and endangered species and not a threat to other wilderness resources, public safety, or resources outside of Wilderness.

For fire suppression:

- Favor indirect attack with hand tools and minimum impact suppression tactics.
- Use helicopters, air-tankers, other aircraft, and hand-held motorized devices with approval of the forest supervisor on a case-by-case basis.
- Use tractor-plow units or bulldozers only on fires with an imminent threat to life or private property that cannot be controlled by other means. Require regional forester approval.

## Management Area: Recommended Wilderness & Wilderness Study Areas

Wilderness Study Areas (WSA) on the Nantahala and Pisgah National Forests are lands designated by Congress to study their potential for inclusion in the National Wilderness Preservation System. These Wilderness Study Areas are managed to preserve their wilderness characteristics until Congress designates them as Wilderness or releases them from further consideration.

In addition to WSAs, other National Forest lands evaluated and found to have strong Wilderness characteristics are recommended for inclusion in the National Wilderness Preservation System, and like WSAs, are managed to protect and maintain the ecological and social characteristics that provide the basis for their suitability for Wilderness designation. The following table identifies areas congressionally designated as Wilderness Study Areas, their recommendation status, as well as other areas recommended for Wilderness designation as an extension to Wilderness or WSA or as a standalone area:

**Table 19. Wilderness Study Areas on the Nantahala and Pisgah National Forests**

Wilderness Study Area	Acres	Established	Geographic Area(s)
Craggy Mountain	2,380	1975, Extended 1984	Black Mountains
Harper Creek	7,138	1984	Eastern Escarpment
Lost Cove	5,708	1984	Eastern Escarpment
Overflow	3,200	1984	Highland Domes
Snowbird	8,390	1984, Reduced 1996	Unicoi Mountains
<b>Total</b>	<b>26,816</b>		

**Table 20. Recommended Wilderness Areas on the Nantahala and Pisgah National Forests**

Recommended Wilderness Area	Acres	Geographic Area
Bald Mountains	6,319	Bald Mountains
Southern Nantahala Wilderness Ext., Barkers Creek	998	Nantahala Mountains
Southern Nantahala Wilderness Ext., Chunky Gal	2,055	Nantahala Mountains
Craggy Mountain WSA	3,222	Black Mountains
Harper Creek WSA	7,044	Eastern Escarpment
Joyce Kilmer-Slickrock Wilderness Ext., Deep Creek-Avey Creek	1,912	Unicoi Mountains and Fontana Lake
Joyce Kilmer-Slickrock Wilderness Ext., Sugar Cove Branch	326	Unicoi Mountains
Lost Cove WSA	5,681	Eastern Escarpment
Mackey Mountain	7,872	Black Mountains
Shining Rock Wilderness Ext., Dark Prong	939	North Slope
Shining Rock Wilderness Ext., Sam Branch	688	North Slope
Snowbird WSA	8,335	Unicoi Mountains

Recommended Wilderness Area	Acres	Geographic Area
Southern Nantahala Wilderness Ext., Indian Ridge	1,052	Nantahala Mountains
Unicoi Mountains/Upper Bald River	2,655	Hiwassee and Unicoi Mountains
<b>Total Acres</b>	<b>49,098</b>	

## Desired Conditions

- RW-DC-01** Ecological and social characteristics which make these areas suitable for Wilderness designation are maintained or enhanced. The natural evolving scenic character is shaped primarily by natural processes, which determine the composition and distribution of plant species.
- RW-DC-02** Wilderness Study Areas and recommended Wilderness areas feature structurally diverse older aged forest communities with a continuous forested canopy, except where gaps created by storm events, insects, or disease exist. In places, the forest includes fire-adapted communities.
- RW-DC-03** Within these areas, few if any facilities are provided. Permanent human-made shelters or privies only exist along the Appalachian National Scenic Trail (ANST). Construction of ANST shelters or privies on new sites within recommended wilderness is not appropriate unless there is an obvious and overriding need to protect natural resources from visitor impacts. Structures, including trail features, bridges, signs, or constructed water sources for the comfort or convenience of visitors, are minimal.
- RW-DC-04** Non-motorized and non-mechanized recreation opportunities continue to be enjoyed, with an emphasis on providing a primitive recreation setting. Existing roads, trails, and wildlife improvements may be maintained using current practices until the area is designated as Wilderness.
- RW-DC-05** Proposed actions are designed to meet or exceed the following desired SIOs on lands inventoried as the corresponding scenic classes:

### Recommended Wilderness and Wilderness Study Areas

Inventoried Scenic Class	Desired Scenic Integrity Objective
All scenic classes	Very High

## Standards

- RW-S-01** This management area is not suitable for timber production or timber harvest. Tree cutting may occur incidental to other management activities such as trail construction, trail maintenance, removal of hazard trees, or fireline construction.
- RW-S-02** New facilities or roads are not constructed in these areas, except for ANST shelters or privies if needed to protect natural resources from visitor impacts.
- RW-S-03** Administrative use of motorized equipment or mechanized transport is allowed only for the following:

- Maintenance of trails,
- Treatment of non-native invasive species,
- Removal of man-made elements not compatible with Wilderness, or
- Management actions to maintain or enhance Wilderness characteristics.

- RW-S-04** Allow control of insect and disease outbreaks only when necessary to prevent the spread or threat to adjacent property, to protect the scenic and recreational values, or to reduce hazards to visitors or employees. When actions are needed, first consider biological controls; secondly, hand control methods; and, finally, pesticides. Utilize the least ecologically disruptive technique that will accomplish control of the pest.
- RW-S-05** Manage the trail system for non-motorized and non-mechanized recreation uses consistent with wilderness values.
- RW-S-06** Other than for outfitter and guide services, issue no permits for commercial special uses, such as recreation events. Require outfitters and guides to use and educate participants in “leave no trace” techniques.
- RW-S-07** Issue no permits for the removal of any forest products and allow collection of plant products for personal use only. Allow collection of dead and down wood only for on-site campfire use.
- RW-S-08** Issue permits for scientific research only when it preserves Wilderness character and is compatible with Wilderness values. Allow collection of specimen plants for scientific research with forest supervisor approval.
- RW-S-09** Allow prescribed fire only to reduce a buildup of fuels, restore native forest communities, to provide for threatened and endangered species, and species of conservation concern habitat, or to decrease the risks and consequences of wildland fire escaping from the area. The use of natural fire breaks such as streams, roads, and bare areas is encouraged to minimize fireline construction.
- RW-S-10** These areas are not suitable for Federal oil and gas and other Federal mineral leases, pending final congressional action.
- RW-S-11** These areas are not available for collection of mineral materials for commercial, personal, or free use purposes, although administrative use of mineral materials is allowed.
- RW-S-12** Requests for access to a non-Federal interest in lands pursuant to a reserved or outstanding right are recognized, and reasonable access is granted.
- RW-S-13** Installation or replacement of fixed anchors for climbing or similar activities shall only be done following the latest agency policy on climbing and with the appropriate analysis and line officer approval to ensure no ecological or cultural resource damage occurs and that wilderness values are not impacted. If user installation or replacement is approved, anchors shall be of a non-reflective or camouflaged finish.

## Guidelines

- RW-G-01** Construct, relocate, and maintain trails to the minimum standard necessary for protection of soil, water, vegetation, visual quality, user safety, and long-term sustainability (typically Trail Class 1 or 2). Emphasize trails that appear to be part of a Wilderness environment and not an intrusion upon it.

- RW-G-02** Minimize the use of trail bridges or foot logs. Construct bridges only if necessary for resource protection or for safety reasons.
- RW-G-03** In wildland fire incidents, use minimum impact suppression tactics when possible. No special authorizations are required for motorized equipment use, but firelines constructed with heavy equipment should be a last resort.
- RW-G-04** Allow rehabilitation of firelines and the burned areas to prevent an unacceptable loss of future wilderness resources or to protect resources outside the area. Revegetation work must use plant species native to the area. Evidence of firelines shall be obliterated as soon as practicable.

### **Management Approaches**

Existing roads and facilities are priorities for decommissioning. Soil and water improvements are also high priorities in these areas.

When the concentration or expansion of user-created campsites affects wilderness character, or natural or cultural resources, close and rehabilitate campsites using appropriate and currently accepted techniques.

Naturalize campsites in trail-less areas and naturalize or rehabilitate trail-side campsites where resource damage or impacts to Wilderness character are occurring. Consider temporary or permanent site closures when other management techniques are not successful.

If recommended wildernesses are designated by congress during the life of this Land Management Plan, determine appropriate group size limits by considering area use levels, capacity to maintain opportunities for solitude, and existing group size limits in nearby designated areas. Establishment of area specific group size limits after designation may consider potential benefits of dispersing use from other heavily used wildernesses, or of introducing youth to a wilderness experience through O&G services.



## Management Area: Roan Mountain

The Roan Mountain Management Area protects one of the most unique landscapes in the Eastern United States. Roan Mountain and the greater Roan Highlands encompass a 20-mile massif stretching along the North Carolina and Tennessee border. The mountain's elevation reaches 6,285 feet at the summit, making it one of the highest mountains in the Eastern United States.

The management area includes 9,200 acres of the mountain and the mountain-top balds and protects the scenic integrity and unique wildlife and plant communities in the area, including the summer Catawba rhododendron gardens and stands of spruce-fir and northern hardwoods. Roan Mountain represents one of the richest repositories of temperate zone diversity, including numerous rare communities, four federally listed plants, two federally listed animals, and more than 80 Southern Appalachian endemic or regionally rare species. It possesses several unique geological features, including some of the highest and most prominent sheer cliffs and granite rock outcrops in the Blue Ridge, which support a rich mix of species, including endemics. This management area comprises the core of a larger joint conservation effort referred to as the Highlands of Roan.

The management area is one of the only places on the Forests where grazing can be used as a tool to manage the landscape. The Appalachian Trail crosses the mountain's summit, and the Forest Service maintains a recreation area on the mountain.

### Desired Conditions

- RM-DC-01** Roan Mountain supports distinctive outstanding natural heritage interest through its diverse wildlife and plant communities, exemplary spruce-fir and northern hardwoods, grassland, and heath and alder bald communities. Habitat diversity supports the area's unique and diverse species. Habitat for threatened and endangered plant and animals is resilient in the face of future climate and ecosystem changes.
- RM-DC-02** Biodiversity of the area is protected at landscape, community, species, and genetic levels. In addition to species that are rare globally, regionally, or in North Carolina, sub-species and geographic disjunct species are given special consideration in order to retain genetic diversity.
- RM-DC-03** The area is a recreation destination and an area of high scenic quality. High quality, low impact recreational opportunities include viewing of scenery, nature study, photography, hiking, backpacking, walking for pleasure, picnicking, hunting, angling, wildlife watching, cross-country skiing, auto-touring, and snow shoeing.
- RM-DC-04** Scientific and educational opportunities which are not detrimental to the area's unique resources are provided.
- RM-DC-05** The desired recreation settings range from semi-primitive non-motorized and semi-primitive motorized to roaded natural and rural.
- RM-DC-06** The integrity of the scenic resources is assured by retaining the existing natural appearing character and low level of facility development. Facilities are unobtrusive and subordinate to the surrounding landscape.
- RM-DC-07** Density of open roads remains stable or decreases over time. Roads that are unneeded or are causing undesirable resource impacts are closed. This decrease improves the remote setting for non-motorized recreation, habitat for disturbance-sensitive wildlife, and water quality.

- RM-DC-08** Within the foreground of the Appalachian Trail, the Roan Mountain area supports high quality outdoor recreation experiences and provides for the conservation and enjoyment of the nationally significant scenic, historic, natural, and cultural qualities of the land through which the Appalachian Trail passes. The area is preserved and strengthened by volunteers and volunteer organizations.
- RM-DC-09** Interpretation about the cultural history, rare ecological communities, and biodiversity of the area is provided on kiosks, the Forests website, publications, and brochures, without intrusive signage.
- RM-DC-10** Desired Scenic Character is natural-appearing, pastoral, or cultural/historic.
- RM-DC-11** Proposed actions are designed to meet or exceed the following desired SIOs on lands inventoried as the corresponding scenic classes:

**Roan Mountain Management Area**

Inventoried Scenic Class	Desired Scenic Integrity Objective
1	High
2	High
3	Moderate
4	Moderate
5-7	Moderate

## Objectives

- RM-O-1** Tier 1: Over the life of the plan, maintain grassy balds, both grass or alder dominated, on approximately 350 acres across Round Bald, Jane Bald, Grassy Bald, Bradley Gap, Little Hump, and Big Hump; and restore an additional 10 to 20 acres of grassy balds.
- Tier 2: Over the life of the plan, restore an additional 20 to 40 acres of grassy balds.
- RM-O-2** Tier 1: Within 5 years, an ecosystem management plan for Roan Mountain will be completed incorporating interests from adjacent landowners, conservation groups, and associated state and Federal agencies.
- RM-O-3** Tier 2: Within five years, work with partners to develop a visitor use plan for the Roan Mountain management area, including designating campsites in areas subject to impact from heavy use.

## Standards

- RM-S-01** Management of lands within the Appalachian National Scenic Trail and Overmountain Victory National Historic Trail foreground (up to a half mile) shall be consistent with direction found in the respective ANST and NHT management areas. Where management direction differs, the more restrictive direction applies.
- RM-S-02** This management area is unsuitable for timber production, allowing limited silvicultural practices listed in TIM-S-02, especially to manage for unique habitats and to address forest pests and non-native invasive species.

- RM-S-03** Restore and maintain openings and grassy and alder balds that species depend on using techniques such as prescribed burning, managed natural fire, mechanical treatment, herbicides, and browsers.
- RM-S-04** Climbing, ice climbing, rappelling on cliffs, and boulder climbing are prohibited, except for administrative and species management purposes.
- RM-S-05** Trails are managed as hike-only except where horse-use is allowed on the Over Mountain Victory Trail by special use permit.
- RM-S-06** Within designated critical and suitable habitat for the spruce-fir moss spider, human access is minimized. All recreation facility development is prohibited to minimize habitat desiccation or loss of habitat quality. Development of new trails or trail relocation is contingent upon coordination, and if needed, consultation with U.S. Fish and Wildlife Service.
- RM-S-07** This area is unavailable for mineral exploration or extraction.
- RM-S-08** No new motorized access will be permitted on new lands acquired above 4,000 feet except to provide access to private inholdings, for administrative use, or emergencies.
- RM-S-09** This land is not suitable for new utility corridors or communication/electronic sites.
- RM-S-10** Do not allow commercial collection of Fraser fir seedlings.

### **Management Approaches**

Continue work with the USFWS on species recovery of listed threatened and endangered species.

The Forests will cooperate with partners to promote recreation in less ecologically sensitive areas and provide visitor information and education to protect and maintain the rare communities of Roan Mountain. Management activities on Roan Mountain will be coordinated with the Cherokee National Forest and interested organizations.

The Forests will consider acquisitions that become available and are determined to be critical to the integrity of the Roan Mountain ecosystem.

Activities within the Appalachian Trail foreground are planned and carried out in cooperation with the appropriate AT management partner(s).

Until the new ecosystem management plan for Roan Mountain is developed, consider the recommendations found in Forest Service document “Roan Mountain Highlands Vegetation Management of the Grassy Balds,” for restoring, maintaining, and monitoring grassy balds.

**See also:** Appalachian National Scenic Trail Management Area and Heritage Corridor Management Area

## Management Area: Cradle of Forestry in America

### Background

The Cradle of Forestry in America is a 6,500-acre site within the Pisgah National Forest which was designated in 1968 to commemorate the beginning of forest conservation in the United States. Congress recognized this site as the birthplace of forestry and forestry education in America to promote, demonstrate, and stimulate interest in scientific forest management under the principles of multiple use, and showcase partnership opportunities. The Cradle of Forestry tells the story of the first forestry school and the beginnings of scientific forestry in America. Once home to the Biltmore Forest School, the site includes a visitor center; amphitheater; a collection of historic and reconstructed buildings; picnic areas; trails; and camping opportunities. This management area contains areas of rich ecological diversity such as Southern Appalachian bogs and swamp forests. Additionally, the management area contains the Pink Beds significant interest area. Today, the Cradle of Forestry Management Area is managed for educational, interpretive, research, and historical purposes. All management activities will be compatible with the interpretive and demonstrative nature of the area.

### Desired Conditions

- CF-DC-01** The Cradle of Forestry in America provides an opportunity for forest visitors to explore the past, present, and future of forest management and resulting benefits through interpretation of historical resources and management activities.
- CF-DC-02** Visitors have an opportunity to experience interpretive trails, interactive exhibits, demonstrations, and special events that foster understanding of forestry, multiple use land management, conservation, and cultural resources.
- CF-DC-03** Recreation areas provide a wide variety of recreation opportunities in high-quality and well-maintained developed and dispersed settings.
- CF-DC-04** Facilities and trails enhance the educational and interpretive programming. Facilities also represent and maintain historical values and settings.
- CF-DC-05** Recreation settings range from roaded natural to rural.
- CF-DC-06** Forestry activities, including silviculture and prescribed fire, are designed for demonstration of modern and historical management techniques for ecological enhancement and educational purposes.
- CF-DC-07** A range of access is provided from the popular US 276 corridor (Forest Heritage Scenic Byway) to both open and closed Forest System roads to a system of well-maintained non-motorized Forest System trails.
- CF-DC-08** The primary interpretive area and facilities are universally accessible to all visitors.

### Scenery

#### Desired Conditions

- CF-DC-09** Desired scenic character is natural appearing, rural-forested or pastoral with historic/cultural elements.

- CF-DC-10** Proposed actions are designed to meet or exceed the following desired SIOs on lands inventoried as the corresponding scenic classes:

**Cradle of Forestry Management Area**

Inventoried Scenic Class	Desired Scenic Integrity Objective
All scenic classes	<p>High, Moderate or Low SIO for proposed actions related to forestry education or demonstration which are visible from area roads, trails, or facilities.</p> <p>Moderate SIO for any proposed actions visible in the middleground from the Blue Ridge Parkway or National Recreation Trails.</p> <p>High SIO in the foreground of the Forest Heritage National Scenic Byway.</p>

**Wildlife**

**Desired Conditions**

- CF-DC-11** Ecological values of the Southern Appalachian bog and swamp forest habitats are protected and interpreted.
- CF-DC-12** Management of wildlife fields and other permanently open wildlife habitats is compatible with the congressional intent of the Cradle of Forestry in America.
- CF-DC-13** Management activities demonstrate benefits to wildlife when appropriate.

**Standards**

- CF-S-01** Protect existing cultural resource properties to enhance interpretation of historical significance to the public.
- CF-S-02** Camping in the Cradle of Forestry is only allowed in permitted areas.
- CF-S-03** Mineral leasing is only permitted with special stipulations to protect the historic, educational, and interpretive values of the area. Stipulate in all new leases no surface occupancy within interpretive areas unless compatible with exhibit objectives.
- CF-S-04** The Cradle of Forestry is not suitable for timber production, but vegetation management is allowed. Timber harvest is encouraged for the enhancement, maintenance, or creation of demonstration objectives, showing both historical practices and modern techniques.

**Guidelines**

- CF-G-01** Assure all planned activities, including but not limited to silvicultural practices, prescribed fire, research, road, trail building and maintenance, facility maintenance,

recreational activities, special uses, and interpretive programs are compatible with the congressional intent for the Cradle of Forestry.

- CF-G-02** Design new facilities to be architecturally compatible with existing structures, historic structures, and the historic setting of the area.

### **Management Approaches**

Cooperate with and receive the cooperation of public and private agencies, organizations and individuals in the development, administration, and operation of the Cradle of Forestry.

**See also:** Conservation Education; Special Interest Areas (Pink Beds)

## Chapter 5: Monitoring and Adaptive Management

Healthy sustainable forests are vital to our future, and consistent, large-scale, and long-term monitoring of key indicators of status and trends are necessary to identify forest resources changing across large regions.

Monitoring and evaluation are continuous learning tools that form the backbone of adaptive management. The monitoring and adaptive management system used by the National Forests in North Carolina includes the following pieces:

1. a **monitoring program** that identifies key questions and indicators for reporting progress or obtaining new information;
2. a **monitoring guide** where information collection procedures are developed for questions of special interests or when high uncertainty exists;
3. **Records** of monitoring information;
4. Biennial or other monitoring **reports** that provide a feedback loop for potential changes.

The monitoring program can be found in this chapter, while the monitoring guide, monitoring records, and monitoring reports are contained outside of this plan.

### How can monitoring questions be changed?

**Monitoring questions may be updated over the life of the plan in keeping with the latest science and methods. Therefore for the latest monitoring questions, plan users should refer to the latest monitoring report.**

Adaptive management requires the ability to be nimble, and the new planning process enables changes to the monitoring plan without a plan amendment. A change to a monitoring question or an indicator is a substantive change to the plan, which may be made administratively after the public has an opportunity to comment. (36 CFR 219.13). A correction of clerical error, a non-substantive change to the plan monitoring program, requires only advance notice. A change to a monitoring guide or annual monitoring work plan is not a change to the plan monitoring program nor other administrative change of the plan and does not require public notification. (See FSH 1909.12, ch. 30, sec. 32.4 for more information and public notice requirements).

### Monitoring Program

The plan monitoring program provides information necessary to evaluate whether plan direction and management are effective in maintaining or achieving progress toward the desired conditions and objectives for the plan area. The monitoring program includes the specific monitoring questions and associated indicators that are to be used for forest plan evaluations, feedback for adaptive responses, and reporting. Monitoring questions and associated indicators are based on one or more plan components, but not every component has a corresponding monitoring question.

This plan monitoring program will help to daylight answers to these three questions:

- Are we implementing the forest plan properly? Are we meeting our management objectives and project guidelines? (Implementation monitoring)
- Is our plan effective? Are we achieving our forest plan management goals and desired outcomes? (Effectiveness monitoring)

- Does our hypothesis testing indicate we may need to change the forest plan? (Validation monitoring)

Implementation monitoring is important for tracking progress and accomplishments. However, it is effectiveness and validation monitoring that drive and support the adaptive management process.

Effectiveness monitoring evaluates condition and trends relative to desired conditions. Validation monitoring tests hypotheses and provides information that might necessitate changes to desired conditions in the plan (e.g., is what we think the desired state should be really accurate?)

Monitoring will provide information needed to address adaptive management including:

- Detect changing conditions, risks, and uncertainties that require adaptive responses; and
  - Identify if a change to the plan monitoring program is warranted based on new information.
- Monitoring questions and indicators may be modified through the adaptive management approach over time as determined in the biennial reports and evaluations.

Providing timely, accurate monitoring information to the responsible official and the public is a key requirement of the Forest Plan Monitoring Program. Periodic evaluations of conditions and trends of the monitoring questions form the basis for continuous plan improvement and provide information for responses to change. Using the Forest Plan Monitoring Program, the agency will develop biennial reports with evaluations that reflect the current status and trends of desired conditions described here.

Some monitoring is best conducted at scales larger than either of these National Forests. This is justified on the basis that some questions are more efficiently addressed for multiple National Forests at the same time and that some issues are more meaningful at larger scales. To support needs of this kind, the 2012 Planning Rule requires that regional foresters develop broad-scale monitoring strategies (219.12 (b)). The Region 8 Broad Scale Monitoring questions relate to climate change information and social, economic, and or cultural conditions.

The Forest Plan Monitoring Program requires a coordinated effort of many people, from the people who collect the data, to the people outside the Forest Service who provide feedback and assistance, to the decision maker.

This monitoring program has two tiers as follows, similar to the tiers of the forest plan objectives:

- **Tier 1** includes questions and indicators where it is within the fiscal capability of the Nantahala/Pisgah National Forests to collect and evaluate the data. The Forest Service is responsible for addressing all Tier 1 questions.
- **Tier 2** includes questions and indicators that require additional capacity to complete monitoring tasks. The Forest Service would coordinate with stakeholders to address Tier 2 questions. As such, Tier 2 questions have a shared responsibility, and therefore, the Nantahala/Pisgah monitoring team cannot assure the timing and quality of data collection and/or the evaluation of these questions. For many Tier 2 questions, relationships with partners currently exist, and partners are currently engaged in monitoring collection or data interpretation, while other Tier 2 questions would not be possible without additional resources or capacity.

Monitoring and evaluation requirements have been established through the National Forest Management Act (NFMA) at 36 CFR 219. Additional direction is provided by the Forest Service in Chapter 30 – Monitoring – of the Land Management Handbook (FSH 1909.12). Below, Table 21 identifies the categories of monitoring questions and indicators based on the 2012 Planning Rule.



**Table 21. Categories of Monitoring Questions and Indicators Based on the 2012 Planning Rule**

<b>Category</b>	<b>Description</b>
Category 1	The status of select watershed conditions
Category 2	The status of select ecological conditions including key characteristics of terrestrial and aquatic ecosystems
Category 3	The status of focal species to assess the ecological conditions under 36 CFR 219.9
Category 4	The status of a select set of ecological conditions required under 36 CFR 219.9 to contribute to the recovery of federally listed threatened or endangered species, conserve proposed and candidate species, and maintain a viable population of SCC
Category 5	The status of visitor use, visitor satisfaction, and progress toward meeting recreation objectives
Category 6	Measurable changes on the plan area related to climate change and other stressors
Category 7	Progress toward meeting the desired conditions and objectives in the plan, including multiple use objectives. Social, economic, and cultural sustainability must also be addressed in the monitoring program.
Category 8	The effects of each management system to determine that they do not substantially and permanently impair the productivity of the land (16 USC 1604(g)(3)(c))

Forest plan monitoring questions are in addition to required monitoring under the Endangered Species Act, Clean Water Act, Clean Air Act, and other laws, and are not intended to be inclusive of all monitoring that occurs on the forest.

Each of the eight categories listed in the 2012 Planning Rule has a three-column table as follows.

- **Monitoring Question** is the question(s) on which to collect information and report. The labels, such as MQ 1-1-T1, use a code where MQ stands for monitoring question, the first number stands for the category (1 through 8), the second number stands for the monitoring question number in that category, T1 or T2: T1 stands for Tier 1 and T2 stands for Tier 2. For example, MQ 1-1-T1 is the Monitoring Question for Category 1, first question, Tier 1.
- **Indicators** – measures collected and reported
- **Reporting Period** - the results of an evaluation of data reported on this cycle. A monitoring and evaluation report is documented on a 2-year cycle, however, not every monitoring question will have enough data for meaningful evaluation. Even though a monitoring question would be evaluated on a longer reporting period (e.g. 4 year or 6 year), the data would be collected continuously. It is anticipated that for most monitoring questions, the first cycle of monitoring (2 year after plan approval) will report on the processes for collecting and evaluating the data, along with a status check of the data collected to date.

Note that the separate monitoring guide document, rather than the monitoring program identified in this chapter, will outline the methodology for monitoring questions. For example, for question MQ-2-6-T1 that intends to monitor departure from the Natural Range of Variation over time, the methodology to conduct this analysis will be outlined in the monitoring guide. The guide will explain how NRV ranges identified in the planning process will be used as a base for updating changes in departure over time. The monitoring guide will set up the system for determining how well desired conditions are being met and whether the forest needs to adapt monitoring methods. Only the monitoring questions, indicators and reporting periods are contained in the plan itself.

**Category 1. Monitoring questions and indicators related to the status of select watershed conditions.**

For this category, monitoring questions are developed that address the theme of providing clean and abundant water. Topics include watersheds, water, aquatic systems, streamside zones, and air because the desired conditions and objectives for these topics are interrelated under this category.

**Monitoring questions may be updated over the life of the plan, therefore for the latest monitoring questions, plan users should refer to the latest monitoring report.**

**MON-Table 1. Monitoring Questions and Indicators for the Status of Select Watershed Conditions**

Monitoring Question(s)	Indicator(s)	Reporting Period
MQ 1-1-T1. What are the conditions of <b>priority watersheds</b> ? What action plans have been developed? To what extent have action plans been implemented and effective?	Extent of priority watersheds in properly functioning condition, as indicated by the Watershed Condition Framework (WCF). The WCF includes indicators for water quality and quantity, aquatic habitat and biota, riparian, soils, fire regime, forest cover and health, road, and trail impacts.	4-year
MQ 1-2-T1. What is the status of the <b>acid neutralizing capacity</b> threshold in the watersheds selected for analysis?	Sulfur and nitrogen deposition levels	4-year
MQ 1-3-T1 What are the needs for <b>aquatic organism passages</b> on national forests?	Extent of aquatic organism passage needs, number of crossings repaired, and miles of aquatic habitat reconnected (with references to benefitting species).	6-year
MQ 1-4-T2. What is the change in <b>occupied range of brook trout</b> across the forests?  What is the change in <b>occupied range of brook floater and other freshwater mussels</b> across the Blue Ridge Province?	Change in estimated occupied range of brook trout on national forests. See MQ-3-1-T2.  Change in estimated occupied range across the sub-region of the Blue Ridge Province. See MQ-3-2-T2.	6-year
MQ 1-5-T1. What are the trends in <b>conditions of streamside zones and stream channels</b> in priority watersheds on national forests?  MQ 1-6-T2. What are the trends in conditions of streamside zones in watersheds that are not selected as a priority for restoration?	Indicators could include: area of management within streamside zones and its impact on riparian vegetation condition, channel shape and function, and large woody debris.	4-year

**Category 2. The status of select ecological conditions including key characteristics of terrestrial and aquatic system.**

**Monitoring questions may be updated over the life of the plan, therefore for the latest monitoring questions, plan users should refer to the latest monitoring report.**

For this category, monitoring questions are developed that address the Plan theme of Sustaining Healthy Ecosystems. Topics include terrestrial ecosystems (note: aquatic system questions are under Category 1 above).

**MON-Table 2. Monitoring Questions and Indicators for Selected Ecological Conditions**

Monitoring Question(s)	Indicator(s)	Reporting Period
MQ 2-1-T1. What is the trend in <b>young forest</b> conditions? How much young forest is present by ecozone? What amount of young forest is above 2500' and within NCWRC Wildlife Habitat Active Management Areas? What disturbances contributed toward the trend in young forest?	Acres, location and percent of young forest by ecozone and by forestwide  Amount of measurable young forest by disturbance type	4-year
MQ 2-2-T2. What is the trend in <b>open forest</b> conditions? How much open forest is restored by ecozone? What amount of open forest is within fire priority areas and NCWRC Wildlife Habitat Active Management Areas? What disturbances contributed toward the trend in open forest?	Acres, location and percent of open forest by ecozone and forestwide  Amount of open forests by disturbance type	6-year
MQ 2-3-T2. What <b>old growth characteristics</b> are accruing in the designated old growth network?	Sample of the old growth patches in the network and by ecozone for old growth indicators such as:  Density of large trees Downed woody debris Snags	6-year
MQ 2-4-T2. What is the trend in conditions of <b>fire-adapted ecozones</b> ? What are the return fire intervals for these zones?	Acres of prescribe fire by ecozone and fire return interval in Fire-Adapted Priority Areas	6-year
MQ 2-5-T2. What are the trends in <b>oak regeneration</b> ?	The proportion of oak species present in oak dominated forest differing seral states (sample based).	4-year
MQ 2-6-T1. Are we moving toward <b>desired seral stages</b> ?	Forestwide NRV departure table seral stages	4-year

Monitoring Question(s)	Indicator(s)	Reporting Period
How much and where is <b>compositional restoration</b> occurring?	Acres of compositional restoration in areas of active management, by ecozone	6-year
MQ 2-7-T1. What is the trend in occurrences of <b>nonnative invasive</b> species? What are occurrences within ecozones? Unique habitats? What percent of NNIS have been treated and how effective have treatments?	Acres of treatments; number of infestations with less non-native invasive species.	2-year
MQ 2-8-T2 What is the status of principle canopy disturbing <b>insect, disease and other pathogens</b> affecting forest health, including new threats? How effective have treatments helped to stabilize those threats?	Acres treated by threat Evaluation of treatment effectiveness Identification of new threats and management strategies	4-year
MQ 2-9-T1. What is the status of <b>air quality</b> ?	National Ambient Air Quality Standards, including particulate matter and ozone	4-year

**Category 3. The status of focal species to assess ecological conditions.**

**Monitoring questions may be updated over the life of the plan, therefore for the latest monitoring questions, plan users should refer to the latest monitoring report.**

For this category, monitoring questions are developed to supplement monitoring effectiveness for conditions identified in Categories 1 and 2 above. Please note that all the monitoring questions for this category are listed as “Tier 2” because the Forest Service cooperates with other government agencies, NGOs, and other stakeholders to collect and evaluate information about focal species.

**MON-Table 3. Monitoring Questions and Indicators for the Status of Focal Species to Assess Ecological Conditions**

Monitoring Question(s)	Indicator(s)	Reporting Period
MQ 3-1-T2 What is the status of <b>brook trout populations</b> across the forest?	Estimated occupied range of brook trout on the forests, expressed as number of documented occurrences OR miles of occupied habitat).	4-year
MQ 3-2-T2 What is the status of <b>freshwater mussels</b> across the forest?	Estimated occupied range, expressed as number of documented occurrences OR miles of occupied habitat).	4-year

Monitoring Question(s)	Indicator(s)	Reporting Period
MQ 3-3-T2 What is the status of <b>ruffed grouse, golden-winged warbler, white-tailed deer, and elk</b> in relation to multiple successional stage conditions, especially young and/or open forest?	Presence of and/or trends in ruffed grouse, golden-winged warbler, white-tailed deer, and elk (expressed as number of occurrences, population trends, NCWRC harvest data, or other monitoring efforts).	4-year
MQ 3-4-T2 What is the status of <b>cerulean warbler, wood thrush, salamanders, and bats</b> to evaluate successional stages, especially mature (late and old growth) forest?	Presence of and/or trends in of cerulean warbler, wood thrush, salamanders, and bats (expressed as number of occurrences, population trends, or other monitoring efforts).	4-year
MQ 3-5-T2 What is the status of <b>shortleaf pine</b> to evaluate conditions of fire adapted systems?	In fire adapted ecozones, specifically fire adapted priority areas, the presence of: shortleaf pine in pine systems	4-year
MQ 3-6-T2 What is the status of <b>ginseng</b> ?  Are more abundant populations of ginseng occurring in rich cove forests or other ecozones?	Abundance of ginseng in forest-wide plots  Presence of ginseng	6-year

**Category 4. The status of select ecological conditions to contribute to the recovery of federally listed threatened or endangered species, conserve proposed candidate species, and maintain a viable population of Species of Conservation Concern.**

**Monitoring questions may be updated over the life of the plan, therefore for the latest monitoring questions, plan users should refer to the latest monitoring report.**

For this category, monitoring questions are developed to track the status of finer filter habitats used by species at risk. Please note that some of the monitoring questions for this category are listed as “Tier 2” because the Forest Service cooperates with other government agencies, NGOs, and other stakeholders to collect and evaluate information about conditions for at risk species.

**MON-Table 4. Monitoring Questions and Indicators for the Status of Select Ecological Conditions that Contribute to Habitat for Species at Risk**

Monitoring Question(s)	Indicator(s)	Reporting Period
MQ 4-1-T2. What are the conditions of <b>caves, abandoned mines, and other bat hibernacula</b> that support species such as Indiana bat, Northern long-eared bat, gray bat, and Virginia big eared bat?	Habitat rating and occupancy, existing and potential, as expressed in NCWRC annual hibernacula monitoring.	2-year

Monitoring Question(s)	Indicator(s)	Reporting Period
MQ 4-2-T1. What are the conditions of <b>Southern Appalachian bogs</b> and what percent have been restored with appropriate shrub and tree densities, suitable composition and fully functioning hydrology?	Habitat rating and occupancy of appropriate species	2-year
MQ 4-3-T1. What are the conditions of <b>selected high elevation rocky summits</b> (on Roan Mountain) that support species of Cliff Avens, Mountain Bluet, and Blue Ridge Goldenrod?	Habitat rating, based on open shrub and canopy density and non-native invasive plant density, and rare plant occupancy (existing and potential)	2-year
MQ 4-4-T1. Are existing <b>Grassy Balds</b> maintained to desired conditions in order to support appropriate native species including rare plants such as Gray's lily?	Habitat rating, based on open shrub and canopy density and non-native invasive plant density and appropriate native species occupancy (existing and potential)	2-year
MQ-4-5-T1. In the <b>Chattooga River Corridor</b> above Highway 28, are rare plant species or aquatic habitats affected by: recreational uses, additional large woody debris from hemlock mortality, or removal of large woody debris by users?	Endangered and locally rare plant species, aquatic habitats, large woody debris, including an assessment of Rock Gnome Lichen ( <i>Gymnoderma lineare</i> ) along the main stem of the Chattooga River	2-year
MQ-4-6-T1 What is the condition of <b>mountain golden-heather</b> and <b>Heler's blazing-star</b> in Linville Gorge Wilderness, Woods Mountain area, Lost Cove Cliffs area?	Population trends	6 year

**Category 5. The status of visitor use, visitor satisfaction, and progress toward meeting recreation objectives.**

**Monitoring questions may be updated over the life of the plan, therefore for the latest monitoring questions, plan users should refer to the latest monitoring report.**

For this category, monitoring questions are developed to track the status of recreation settings, dispersed and developed recreation uses, and scenery. These topics are significant in realizing a major theme of the forest plan: Connect People with the Land.

**MON-Table 5. Monitoring Questions and Indicators for the Status of Visitor Use and Satisfaction, and Progress Toward Meeting Recreation Objectives**

Monitoring Question(s)	Indicator(s)	Reporting Period
MQ 5-1-T2. How has <b>collaborative recreation planning</b> been implemented and what outcomes have resulted from collaborative recreation planning. for sustainable recreation?	Number collaborative planning efforts for recreation resources	4-year
MQ 5-2-T2 What Connecting People to the Land goals in <b>Geographic Areas</b> have been achieved? What goals were considered during collaborative recreation planning?	Geographic Area goals: Connecting people to the land- -planned and achieved	4-year
MQ 5-3-T1 Are <b>trails meeting national quality standards</b> ?	% of trails managed to standard	4-year
MQ 5-4-T2 What is the <b>trend in recreation uses and visitor satisfaction</b> ?  Are there <b>new uses</b> that can have potential impacts to biological, cultural, or other resources?	NVUM: National Visitor Use Monitoring	6-year
MQ 5-5-T1 What <b>new trail construction</b> has been authorized?	Miles of new trail construction authorized	4-year
MQ 5-6-T1. What is the trend in <b>meeting Scenery Integrity Objectives</b> ? How often and under what circumstances are scenic classes needing adjustments? And are these adjustments adequately updated in the scenic class inventory?	% of management actions meeting Scenic Integrity Objectives  Number of scenic class inventory adjustments	4-year
Along the <b>Upper Chattooga River</b> :  MQ 5-7-T1: Are at-one-time vehicle counts at frontcountry and backcountry parking areas changing?	Vehicles-at-one time	5-year



Monitoring Question(s)	Indicator(s)	Reporting Period
MQ 5-8-T1: What is the proportion of recreation use by type of visitor in frontcountry areas and backcountry reaches and how is this related to vehicle counts?  MQ 5-9-T1: How is total daily backcountry use related to the number of encounters? Is the number of encounters affecting opportunities for solitude in the backcountry? How do the number of encounters compare to user tolerances?  MQ 5-10-T1: How are daily frontcountry use levels affecting perceptions of crowding, congestion or desired experiences in the frontcountry areas?	Groups-at-one-time in the frontcountry, people-at-one-time in the frontcountry, groups per day in the backcountry, people per day in the backcountry, vehicles-at-one-time  Encounters in the backcountry  Perceptions of crowding and congestion	10-year
MQ 5-11-T1: Where and how is <b>visitor use in Wilderness</b> affecting solitude and other desired conditions?	Wilderness character monitoring for solitude	6-year

#### Category 6. Measurable changes on the plan area related to climate change and other stressors.

Monitoring questions may be updated over the life of the plan, therefore for the latest monitoring questions, plan users should refer to the latest monitoring report.

This category addresses the resiliency of the national forests to absorb change and respond to disturbances. The questions are framed as Tier 2 because they are addressed through the R8 Broad Scale Strategy.

#### MON-Table 6. Monitoring Questions and Indicators that Track Changes that May Be Due to Climate Change

Monitoring Question(s)	Indicator(s)	Reporting Period
MQ-6-1-T1 How has <b>climate variability</b> changed and how is it projected to change across the region?	Climate extremes, temperature, precipitation and their impacts on NFS lands	5-year
MQ-6-2-T1 How is climate variability and change influencing the <b>ecological, social, cultural, and economic conditions and contributions</b> provided by plan areas in the region?	Nonnative Invasive Species, Forest Health, Prescribed Fire, Recreation Use & Satisfaction, Wildlife, Jobs & Income, Phenology, Forest Trends	5-year
MQ-6-3-T1 What <b>effect do management units</b> in the region have on a changing climate?	Carbon Stocks and Fluxes	5-year
MQ 6-4-T1 What is the status and trend in <b>carbon stocks</b> on the national forests?	FIA reports on carbon status	4-year

Monitoring Question(s)	Indicator(s)	Reporting Period
MQ 6-5-T2. What <b>disturbances</b> have occurred across the forests what proportion are natural disturbances?	Number, type and degree of disturbances and proportion of that are natural disturbances  Evaluation of disturbances on: geophysical settings; ecozones, species at risk, unique or special habitats, recreational uses	6-year
Climate change vulnerability assessments MQ 6-6-T2: What are <b>values at risk</b> associated with changing hydrologic disturbances and what prioritized actions can be taken to mitigate these risks?  MQ-6-7-T2: What <b>adaptation strategies</b> have been taken to address change to these ecosystems and unique habitat: spruce fir ecozones; high elevation rocky summits rare habitats; cold water streams (brook trout habitat)?	To be developed during monitoring guide development	4-year
MQ-6-8-T2  What are the trends in forest <b>streamflow</b> quantity?	Hydrograph and stream gauge trend data from USGS;  Research from Coweeta Hydrologic Lab.	4-year

**Category 7. Progress toward meeting the desired conditions and objectives in the plan, including multiple use objectives. Social, economic, and cultural sustainability must also be addressed in the monitoring program.**

**Monitoring questions may be updated over the life of the plan, therefore for the latest monitoring questions, plan users should refer to the latest monitoring report.**

Along with Category 5, this category is useful for addressing desired conditions and objectives that relate to the theme of connecting people to the land and other multiple use objectives. Social and economic contributions are addressed through the R8 Broad Scale Strategy.

**MON-Table 7. Monitoring Questions and Indicators that Address Social, Economic, and Cultural Sustainability**

Monitoring Question(s)	Indicator(s)	Reporting Period
MQ 7-1-T2 What changes are occurring <b>in social, cultural, and economic conditions</b> in the Nantahala & Pisgah NFs area of influence?	R8 Broad Scale Strategy  Indicators include but are not limited to incomes, employment, poverty levels, industry sectors, and other ecosystem services for provisioning, supporting, or regulating services	5-year
MQ 7-2-T1 What <b>volume and products</b> is the forest timber sale program contributing to the economy?	Timber volume sold  Product mix	2-year
MQ 7-3-T1 What changes have occurred in the <b>transportation system</b> ? Has a TAR been updated and a minimum road system identified?	Miles by road management objective  Miles of unneeded roads  Miles of open, seasonally open, and closed roads	4-year
MQ 7-4-T1 What are the trends in <b>road maintenance</b> ? Has a forestwide road maintenance plan been developed and implemented?	Miles maintained to standard annually  Miles decommissioned annually	4-year
MQ 7-5-T1 What are the trends in <b>cultural resources</b> deferred maintenance and site evaluations?	Trend in deferred maintenance backlog  Trend in cultural resource site evaluation backlog	4-year
MQ 7-6-T1 What is the status of comprehensive planning for the <b>Trail of Tears</b> ?	Number of associated cultural resources inventoried within corridor	4-year
MQ 7-7-T2 What are the <b>harvest rates</b> of selected <b>non-timber forest products</b> and are these rates within sustainable limits?	Evaluation of harvest rates for the following (but not limited to) ramps, Galax and black cohosh.	4-year
MQ 7-8-T2  How does sustainable plant harvesting and application of traditional harvest methods impact or benefit plant populations?  How does the application of <b>traditional ecological knowledge</b> effect or benefit forest resources?	Identified with input from Tribes  Projects and research activities focused on tribal resources	4-year
MQ 7-9-T2	Events or programs hosted by FS;	4-year

Monitoring Question(s)	Indicator(s)	Reporting Period
What <b>events</b> or changes in <b>programs</b> have occurred that contribute to better understanding of forest resources?	Events or programs hosted by stakeholders with FS involvement;  Change in volunteer and service programs;  Evaluation of collaboration with state and local governments and Indian tribes	
MQ 7-10-T1 What are the trends in <b>wildfires</b> and <b>prescribed fires</b> ? How effective are prescribed fires for providing community protection as well as restoration of native ecosystems and wildlife habitats?	Number and size of wildfires annually;  Number, size, and locations of prescribed fires annually  Amount of prescribed fire in fire-adapted priority areas and communities at risk	2-year

**Category 8. The effects of each management system to determine that they do not substantially and permanently impair the productivity of the land (16 USC 1604(g)(3)(c).**

**Monitoring questions may be updated over the life of the plan, therefore for the latest monitoring questions, plan users should refer to the latest monitoring report.**

This category is useful for tracking the conformance and effectiveness of best management practices to prevent soil erosion and loss of soil productivity.

**MON-Table 8. Monitoring Questions and Indicators for Tracking Best Management Practices**

Monitoring Question(s)	Indicator(s)	Reporting Period
MQ 8-1-T1. Is <b>site productivity</b> maintained through proper soil management?	Area extent of soil disturbance	4-year
MQ 8-2-T1. How are activities meeting <b>water quality</b> standards?	Evaluation of implementation and effectiveness of selected BMPs for the protection of water quality	4-year

## Monitoring Guide

The monitoring guide, which will be developed after the forest plan has been finalized, will outline procedures for addressing the questions and indicators in the monitoring program. The guide will identify the tactical information needed to implement the monitoring program, such as specific tasks or monitoring activities needed to answer the questions; staff or partners that will conduct the monitoring activities; timelines; and the location of recorded information. Guidance is not needed for every monitoring question. There are many questions where the procedures have been developed and used to collect information for past and present monitoring. For example, the R8 Bird Monitoring protocols are well established and have been used for decades.

The guide may include management alerts that identify conditions or circumstances that cause concerns and should be investigated, along with corrective actions to be taken when needed. At forest level

planning, management alerts would notify managers that the plan strategies may need course corrections in order to reach desired conditions.

Partners will be involved in monitoring guide development. Coordination on specific monitoring questions will be outlined for Tier 2 questions including partners that will contribute to the monitoring reports such as the Federally Recognized Tribes, U.S. Forest Service Southern Research Station, U.S. Geological Survey, the U.S. Fish and Wildlife Service, the NC Wildlife Resources Commission, the NC Natural Heritage Program, the State Historic Preservation Office, and others.

## Appendix A: Consolidated Forest Plan Objectives

*This appendix identifies all of the plan objectives across resource topics in one location, organized by desired completion timeframe.*

Forest plan objectives are a critical part of understanding the actions that will take place during that timeframe – they help focus and prioritize activities. While objectives are listed throughout the plan in their respective resource sections, this document consolidates those objectives in one place.

**How do objectives fit in?** The forest plan provides a general framework for managing the forest over the next 10-15 years. First, the plan outlines desired conditions that describe what we want the forest to be like in the future. Next, objectives outline measurable steps the forest will take to achieve those long-term goals. Objectives do not come with funding or guarantee that the budget will allow completion of this work, therefore, objectives must be based on budgets and staff capacity that is reasonably foreseeable. Objectives are not considered targets, but they will be the forest priorities for the 10 to 15 years following plan approval. Not every action the Nantahala and Pisgah National Forests may take is included as an objective, since objectives are intended to identify priorities and not every activity. Objectives are not meant to be a limit on planned activities and may be exceeded. Objectives are closely related to the plan monitoring strategy, where the plan will evaluate “Did we accomplish the objective?” and “Did that accomplishment create the outcomes we desired, trending toward desired conditions?”

This document contains the consolidated set of forest plan objectives from throughout the Plan. These objectives apply to the entire Nantahala and Pisgah landscape (unless otherwise stated) and should be considered holistically rather than individually. These objectives relate to the four forest plan themes of connecting people to the land, sustaining healthy ecosystems, providing clean and abundant water, and partnering with others. They respond to the needs for restoring forests, protecting and enhancing watershed conditions, conserving wildlife habitats, and contributing to social values and economic goods and services.

**Trying something new: two Tiers.** When the FS shared an initial set of objectives, we heard a common refrain on every topic: What is identified is great, but not enough – can the FS do more? What about if partners and others help to accomplish work on forest lands?

Directly in response to public comments on that initial set, the Nantahala and Pisgah decided to try something new and identify two sets of objectives - Tier 1 and Tier 2 Objectives. Tier 1 Objectives are based on a continuation of recent FS budgets and capacity, while Tier 2 Objectives reflect additional outcomes that may be possible with added capacity of partners and partner resources. By outlining what we may be able to achieve with the help of others, we aim to incentivize shared stewardship and build partnerships to achieve more work on the ground.

**Can the Forest Service do more than the objectives identify?** Absolutely. We recognize that current and projected accomplishments are constrained by FS anticipated budget and staffing. Where we can increase program efficiency or funding through innovative tools and partnerships we may be able to achieve more or move more quickly toward desired conditions.

**How were these objectives determined?** Forest leadership and the interdisciplinary team of specialists working on the forest plan revision team developed a list of actions intended to implement the plan. The list considered the [Forest Plan Assessment](#) findings and the [Need for Change](#), as well as recent trends, past experiences, anticipated staffing levels, and anticipated budgets. The list was refined based on input from public comments. Objectives were considered for this list if they related to forest plan themes, contribute to sustainability, appeared technically and fiscally feasible for more detailed analysis, can be implemented with a high degree of broad public support, contribute to a long-term commitment,

enhance management effectiveness and efficiency, or provide opportunity to partner or coordinate with others. The Environmental Impact Statement, analyzes the effects of these proposed objectives, including their feasibility and potential impacts on forest resources.

**Can objectives be changed?** After a plan is signed, changes in environmental conditions, budgets or other factors may result in a need to re-evaluate plan objectives. If, after the plan is signed, an objective is no longer appropriate or relevant for achieving desired conditions, then the objective can be removed or modified through a plan amendment.

## Annual Objectives

### *Connecting People to the Land*

**Volunteer and service participants:** Annually ensure that volunteers and service participants have the appropriate supervision, coordination, program direction, safety training, certifications, and protective equipment to conduct their work in a safe and efficient manner and are recognized for their time in service, significant accomplishments, and/or exemplary safety records. (COM-O-02-Tier 1)

**Road Maintenance:** Maintain 280 road miles to standard annually across the Nantahala and Pisgah by performing maintenance, reducing road maintenance level, or decommissioning unneeded roads (*Tier 1*). Reduce the maintenance backlog by an additional 10% annually (*Tier 2*). (TA-O-01)

**Off Highway Vehicle Trails:** Tier 1: Eliminate at least 10 percent of off-highway vehicle trail deferred maintenance annually; accomplished primarily through volunteers, fee revenue, and grants. (REC-O-05-Tier 1)

**Nontimber Forest Products:** Annually, continue to produce local ginseng seeds in the nursery and augment or establish at least ten ginseng populations with southern Appalachian germplasm (seeds or transplants) over the life of the plan. (NTFP-O-02-Tier 1)

**Conservation Education:** Annually, educational and interpretive efforts will expand the suite of programs offered through revisions of existing and/or additions of new programs. These programs will address management needs and will also emphasize efforts for providing youth or underserved populations a better understanding of their natural and cultural environment. (CE-O-01-Tier 1)

### *Providing Clean and Abundant Water*

**Aquatic Organism Passage:** Replace a minimum of two impaired stream crossings annually to improve aquatic organism passage and aquatic community connectivity across the planning unit. (AQS –O-03b-Tier 1)

**Streamside Zones:** Restore at least 3 acres of streamside zones annually to increase vegetation diversity (*Tier 1*). Restore at least 20 acres. (*Tier 2*). (SZ-O-01)

**Stream channel improvement:** Implement at least three stream channel improvement projects annually, using natural channel concepts, focusing on restoring floodplain connectivity, stream bank stability, and enhancement of aquatic habitat diversity (*Tier 1*). Implement at least six stream channel improvement projects annually (*Tier 2*). (SZ-O-02)

**Acid Neutralizing Capacity:** Assess acid neutralizing capacity in one priority watershed annually and utilize the information to inform watershed management and restoration. (WSD-O-02-Tier 1)

**Base cation depletion:** Annually, conduct a site-specific analysis of base cations in 1 to 2 project locations where there is a concern for base cation depletion. Develop mitigation or restoration strategies when these strategies are necessary to restore or protect at-risk water, soils, flora, and fauna. (WSD-O-03-Tier 1)

### ***Sustaining Healthy Ecosystems***

**Young forest habitat:** Increase new young forest conditions by using silvicultural practices on between 650 to 1,200 acres annually (*Tier 1*). Increase new young forest conditions by using silvicultural practices on between 1,200 to 3,200 acres annually (*Tier 2*). (ECO-O-02)

**Stand and forest community improvement:** Conduct stand and forest community improvement practices, increasing from a minimum of 3,800 acres to approximately 6,000 acres annually (*Tier 1*). Conduct stand and forest community improvement practices, on between 6,000 acres to approximately 12,000 acres annually (*Tier 2*). (ECO-O-03)

**Intermediate thinning treatments:** Annually apply intermediate thinning treatments on 150 to 400 acres to address forest health, future composition, and structure desired conditions (*Tier 1*). Annually apply intermediate thinning treatments on 400 to 600 acres (*Tier 2*). (ECO-O-04)

**Open forest woodland:** Annually thin and burn 300 to 600 acres to advance open forest woodland conditions (*Tier 1*). Annually thin and burn 600 to 900 acres (*Tier 2*). (ECO-O-05)

**Fire adapted ecozones and hazardous fuel reduction:** Apply prescribed fire on 10,000 – 20,000 acres annually for restoration and maintenance of fire adapted ecozones and to reduce hazardous fuels (*Tier 1*). Apply prescribed fire on 20,000 – 45,000 acres annually (*Tier 2*). (ECO-O-06)

**Spruce fir ecozones:** Restore 50 acres of spruce fir ecozones per year to improve ecozone composition. (ECO-O-07-Tier 1)

**Forest health threats:** Provide stable or improved forest health conditions on at least 250 acres annually where current or newly established threats are present (*Tier 1*). Improve at least 500 acres annually with cooperator involvement. (*Tier 2*) (FHL-O-01)

**Nonnative Invasive Species:** Annually, treat, control, or eradicate NNIS plant species on 1500 to 3000 acres (*Tier 1*). Annually, treat, control, or eradicate NNIS plant species on 3,000 to 5,000 acres to mitigate the spread to or from adjacent lands where high human uses occur with high risks of NNIS establishment. Inventory up to approximately 4,000 acres for NNIS occurrences (*Tier 2*). (FHL-O-02)

### ***Partnering With Others***

**Daylighting Roads:** Annually daylight at least 2 miles of roads, with an emphasis on closed roads within NC WRC Wildlife Habitat Active Management Area priority areas, for the purposes of creation of young forest conditions and road improvement (*Tier 1*). Annually daylight at least 5 miles of roads (*Tier 2*). (TA-O-05)



## Objectives to be met within 3 years

### ***Connecting People to the Land***

**Non-commercial mineral collection:** Identify areas where tools can be used for non-commercial mineral collection, within three years of plan approval. *(REC-O-03-Tier 1)*

**Trail management objectives:** Complete Trail Management Objectives (TMOs) for all Nantahala and Pisgah National Forest System trails within 3 years, and schedule trail maintenance tasks according to identified frequencies. *(REC-O-04-Tier 1)*

**Travel analysis report:** Re-evaluate and update the Travel Analysis Report (TAR) report within three years of plan approval. This process will identify opportunities to adjust the Forest road system so that it considers access for public and Forest management activities, minimizes road- and trail-associated environmental impacts and public safety risks, site-specific priorities and opportunities for road improvements and decommissioning, and can be maintained within budget constraints. Future development and implementation of Travel Analysis Report recommendations and best available FS data will identify a minimum road system. *(TA-O-02-Tier 1)*

**Archeological impacts from looting:** Within three years of plan implementation, identify archeological sites that are at high risk from looting impacts and develop strategies for site protection and preservation. *(CR-O-03-Tier 1)*

**Nontimber forest product sustainability:** Every two years, assess at least one non-timber forest product to ensure sustainability and stable populations for species with higher harvest rates or biological susceptibility such as American ginseng, ramps, Galax, and Fraser fir. *(NFTP-O-01-Tier 1)*

**Trail of Tears Cultural Landscape Report:** Within two years of plan approval, a Cultural Landscape Report (CLR) for the long-term management, preservation, and treatment of the Trail of Tears and Unicoi Turnpike corridors will be initiated. *(HC-O-01-Tier 1)*

**Trail of Tears Comprehensive Management Plan:** Within two years of the completed CLR, the Comprehensive Management Plan and finalized mapping of the Trail of Tears corridors will be initiated. *(HC-O-02-Tier 1)*

**Overmountain Victory Trail:** Tier 1: Within three years of plan implementation, a CLR should be completed for the long-term management, preservation, and treatment of the Overmountain Victory Trail. *(HC-O-03-Tier 1)*

### ***Partnering With Others***

**Local Government Coordination:** Every other year, host a discussion at the Supervisor's Office with interested WNC local governments or their economic development offices to foster shared actions that support local jobs, attract tourism, and encourage coordination on public health and safety issues. *(COM-O-01-Tier 1)*

**Tribal Communication Plan:** Within two years of plan implementation, complete a Tribal Communication Plan to identify contacts and respective responsibilities and a Memorandum of Understanding clarifying roles and authorities. *(TR-O-01-Tier 1)*

**Tribal Partnership for Restoration:** Within three years of plan implementation, develop a Tribal partnership for restoration. *(TR-O-02-Tier 1)*

## Objectives to be met within 5 years

### *Connecting People to the Land*

**Collaborative Recreation Planning:** Move toward a more ecologically, socially, and economically sustainable recreation program by implementing collaborative recreation planning with stakeholders and local communities to develop a strategic guidance and a shared vision for sustainable recreation for the future within five years. *(REC-O-01a-Tier 1)*

**Trail Supply and Demand:** Within 5 years, begin collaborative trail planning to address equestrian and/or bicycle trail supply/demand issues to meet associated Goals in Bald Mountains, Black Mountains, Eastern Escarpment, and Highland Domes Geographic Areas. *(REC-O-07a-Tier 1)*

**Trail System Planning:** To help move the trail system to a more sustainable condition forestwide, conduct collaborative trail planning across all Geographic Areas every 5-7 years, building on the Nantahala and Pisgah National Forest Trail Strategy. *(REC-O-07b-Tier 1)*

**Historical Route signage:** Within five years of Comprehensive Management Plan approvals, implement signage as appropriate of historical routes for the Trail of Tears, Unicoi Turnpike, and Overmountain Victory trail. *(HC-O-04-Tier 1)*

**Roan Mountain campsites:** Within 5 years, work with partners to develop a visitor use plan for the Roan Mountain management area, including designating campsites in areas subject to impact from heavy use. *(RM-O-03-Tier 2)*

**Appalachian Trail Volunteer Agreements:** Update group volunteer agreements between Ranger Districts and ATC-affiliated maintainer clubs on a 5-year cycle, or more frequently if needed. For consistency, favor developing multi-district group volunteer agreements where appropriate. *(AT-O-01-Tier 1)*

### *Sustaining Healthy Ecosystems*

**Roan Mountain ecosystem management plan:** Within 5 years, an ecosystem management plan for Roan Mountain will be completed incorporating interests from adjacent landowners, conservation groups, and associated state and Federal agencies. *(RM-O-02-Tier 1)*

## Objectives to be met over the life of the plan

### *Connecting People to the Land*

**Road maintenance plan:** Develop and implement a forest-wide road maintenance plan that identifies priority maintenance activities, funding sources, and performance responsibilities over the life of the plan. The work presented in this plan is prioritized to promote public safety, prevent erosion and sedimentation, protect water quality, and maintain Forest access with an emphasis on priority watersheds. *(TA-O-03-Tier 1)*

**Unauthorized road and trails:** Unauthorized road and trail miles within priority watersheds and Inventoried Roadless Areas will be identified and prioritized for obliteration to minimize erosion and sedimentation. A minimum of 20 miles of unauthorized roads and 30 miles of unauthorized trails will be restored to natural contours during the life of the plan. *(TA-O-04-Tier 1)*

**Developed Recreation Sites:** Move toward a more ecologically, socially, and economically sustainable recreation program by improving visitor satisfaction, maintaining, and operating priority developed

recreation sites to a facility condition index of at least 90 percent and to National Quality Standards within 10 years. *(REC-O-01b-Tier 1)*

**Accident analysis system:** Establish a forest-wide accident analysis system of cumulative fatalities to determine if additional safety measures and risk management may be appropriate within the planning period. *(REC-O-03-Tier 1)*

**Trails meeting standards:** Increase trail miles meeting National Quality Standards to 50% over the life of the Plan *(Tier 1)*. Increase trail miles meeting National Quality Standards to 60% *(Tier 2)*. *(REC-O-06)*

**Loop trail opportunities:** Provide 10 new loop trail opportunities by creating short connectors to existing National Forest System trails or gated roads over the life the Plan. *(REC-O-08-Tier 2)*

**Climbing Management Plan:** Through a collaborative process with representatives from the climbing community, utilize inventories of climbing routes, access trails, staging areas, and other information provided by users to develop a climbing management plan (or plans) that provides area-specific guidance following the latest agency policy on climbing, bouldering, and similar activities. The climbing management plan(s) shall consider user desires to improve the climber experience, identify climber education opportunities, ensure resource protection, identify needed closures, and develop monitoring protocol for climbing and similar activities forestwide over the life the Plan. *(REC-O-09-Tier 2)*

**Dispersed campsite operations:** Develop an operation and maintenance guide for all designated dispersed campsites containing provisions for public health and safety, and protection of water, aquatic, and riparian resources over the life the Plan. *(REC-O-10-Tier 1)*

**Open Roads:** No net decrease in the miles of open roads in Interface and Matrix over the life of the plan *(Tier 1)*. Increase mileage of seasonally open roads in Interface and Matrix by between 5-10 percent over the life of the plan, prioritizing recreational access, such as hunting and fishing. Determine the amount of unneeded roads in backcountry and decommission 10 percent over the life of the plan *(Tier 2)*. *(TA-O-06)*

**Energy use:** Over the life of the plan, reduce total energy use across the Forests by at least five percent. *(FAC-O-01-Tier 1)*

**Archeological site maintenance:** Over the life of the plan, reduce deferred maintenance needs at archeological sites and historic structures by 50 percent and continue monitoring at current or higher level. *(CR-O-01-Tier 1)*

**Cultural Resource site evaluations:** Over the life of the plan, reduce the backlog of cultural resource site evaluations by 60 percent. *(CR-O-02-Tier 1)*

### ***Providing Clean and Abundant Water***

**Native trout:** Maintain and expand the occupied range of native brook trout across the Forests . Additionally, maintain or increase populations within this range over the life of the plan. *(AQS –O-01-Tier 1)*

**Aquatic Species at risk:** Maintain and expand the occupied range of freshwater mussels and other aquatic species of conservation concern and federally-listed species across the Forests. Additionally, maintain or increase populations within this range over the life of the plan. *(AQS–O-02-Tier 1)*

**Aquatic organism passage:** Work with partners to complete the assessment of aquatic organism passage (AOP) needs across the Forests over the life of the plan. Prioritize completion of AOP needs that enables reconnection of fragmented populations of brook trout and other aquatic federally listed species SCC, or restoration of these species to suitable unoccupied habitat. *(AQS-O-03a-Tier 1)*

**Watershed restoration action plans:** Develop watershed restoration action plans for 10 priority watersheds for restoration over the life of the plan.

Tier 1: Additionally, implement a minimum of two and a maximum of four watershed restoration action plans to improve the conditions of watersheds from “functioning at risk” to “properly functioning” over the life of the plan. While implementing these action plans, at least the following improvements will occur over the life of the plan:

- Improve a minimum of six to a maximum of 12 water quality and aquatic habitat conditions from “impaired” or “functioning at risk” to “properly functioning” condition.
- Restore a minimum of 15 to a maximum of 20 acres of stream and other wetland ecosystems, focusing on restoring floodplain connectivity, stream channel function (for example, large woody debris), and native riparian vegetation.
- Perform road maintenance activities on 15 miles of roads that are known to be hydrologically connected to the stream network, focusing on those causing degradation of aquatic ecosystems.
- Perform trail maintenance activities on approximately 15 miles of trails, emphasizing trails within 100 feet of streams. Relocate trails that are adversely affecting aquatic health.
- Decommission unneeded roads that are adversely affecting aquatic health.

Tier 2: Develop watershed restoration action plans for 10 priority watersheds for restoration, over the life of the plan, and implement two more watershed restoration action plans, for a total of five to six over the life of the plan.

- Improve 15 to 20 water quality and aquatic habitat conditions from “impaired” or “functioning at risk” to “properly functioning” condition.
- Restore 50 to 100 acres of stream ecosystem, focusing on restoring floodplain connectivity, stream channel function (for example, large woody debris), and native riparian vegetation. (*WSD-O-01*)

### ***Sustaining Healthy Ecosystems***

**Grass, Forb and Shrub habitat:** Maintain 3,750 acres of existing grass, forb, and shrub openings (*Tier 1*). Restore 1,450 acres of grass, forb and shrub openings that are not currently present on the forest (*Tier 2*). (*ECO-O-01*)

**Old Growth Conditions:** Enhance or accelerate the development of **old growth conditions** over time, by actively managing 250 acres for each ten year interval through activities. (*OGN-O-01, Tier 2*)

**Glades and Barrens:** Tier 1: Restore and maintain 11-23 glades and barrens to a woodland or open structural condition, over the life of the plan. (*PAD-O-01-Tier 1*)

**Carolina Hemlock Bluffs:** Maintain all Carolina hemlock bluff sites (approx. 40 sites) to ensure that Carolina hemlocks are reproducing with minimal impact from hemlock woolly adelgid, over the life of the plan. (*PAD-O-02-Tier 1*)

**Southern Appalachian Bogs:** Restore and/or maintain at least 12 Southern Appalachian bogs by reducing woody plant encroachment, over the life of the plan. (*PAD-O-03-Tier 1*)

**Grassy Balds:** Maintain or restore 10-20 acres of existing grassy balds across the Nantahala and Pisgah, outside of Roan Mountain, over the life of the plan. Across these habitat boundaries, maintain a variable size shrub or heath bald. (*PAD-O-04-Tier 1*)

**Roan Mountain Balds:** Over the life of the plan, maintain grassy balds, both grass or alder dominated, on approximately 350 acres across Round Bald, Jane Bald, Grassy Bald, Bradley Gap, Little Hump, and Big Hump; and restore an additional 10-20 acres of grassy balds (*Tier 1*). Over the life of the plan, restore an additional 20 to 40 acres of grassy balds (*Tier 2*). (*RM-O-01*)

***Hudsonia montana* and *Liatris helleri* populations:** Manage and restore *Hudsonia montana* and *Liatris helleri* populations to ensure competing woody plants do not overtop and impact either species. (*PAD-O-05-Tier 1*)

**Wilderness forest communities:** Establish a baseline inventory of forest communities present in Wilderness in order to more effectively monitor deviations from natural conditions. (*CDW-O-02-Tier 2*)

### ***Partnering with Others***

**Traditional Ecological Knowledge:** During the planning period, work with tribes and the Southern Research Station to identify research locations and collaboratively study sustainable plant harvesting, artisan resource management, and the use of traditional ecological knowledge. (*TR-O-03-Tier 1*)

**Wilderness capacity:** In Wildernesses where use affects opportunities for solitude, conduct a Limits of Acceptable Change analysis or capacity study to assess existing conditions, impacts to solitude, and, if necessary, potential management actions to restore desired conditions. (*CDW-O-01-Tier 2*)

## Appendix B: Timber Calculations

This appendix contains information on the planned timber sale program, timber harvest levels, and methods of forest vegetation management practices expected during the plan.

### Suitability of Lands for Timber Production

During forest plan development and revision, assessment of the suitability of lands for timber production is required under the 2012 Planning Rule and National Forest Management Act. Lands identified as suitable for timber production have a regularly scheduled timber harvest program that contributes to forestwide desired conditions and multiple use goals, such as providing mosaics of habitats for wildlife and plant species and contributing to the economic sustainability of local communities by producing timber, pulp, specialty woods, and fuelwood as renewable resources.

Forest Service Handbook 1909.12 CH 60.5<sup>39</sup> provides key definitions used in developing and revising forest plans in regard to forest vegetation resource management. The timber section of the EIS, its appendix B, and detailed white papers in the project record describe the suitability determination process used to develop the numbers displayed in Table B-1.

**Table B-1: Timber Production Suitability Classification**

Land Classification Category	Acres
A. Total National Forest System lands in the plan area	1,043,636
B. Lands not suited for timber production due to legal or technical reasons	349,741
C. Lands that <b>may be</b> suited for timber production (A-B)	693,895
D. Total lands <b>suited</b> for timber production because timber production is compatible with the desired conditions and objectives established by the plan	458,027
E. Lands not suited for timber production because timber production is not compatible with the desired conditions and objectives established by the plan (C-D)	235,868
Total lands <b>not suited</b> for timber production (B+E)	585,609

<sup>39</sup> [http://www.fs.fed.us/im/directives/fsh/1909.12/wo\\_1909.12\\_60.docx](http://www.fs.fed.us/im/directives/fsh/1909.12/wo_1909.12_60.docx)

## Forest Utilization Standards

The Forest Utilization Standards were based on the NC Supplement of the timber sale preparation handbook, Chapter 50 (R8 NC 2409.18, 2012). Species not assigned to a volume group by the supplement were added to the most appropriate group. This handbook may be updated and species groups changed at any time.

For more information about the use of the Forest Utilization Standards in Forest Vegetation Simulator (FVS), refer to the white paper: FVS Modeling for the National Forests of North Carolina Land and Resource Management Plan in the project record. For more information about the Spectrum model and its use in the effects analysis for the Nantahala and Pisgah Plan Revision EIS refer to the EIS Appendix B.

**Table B-2: Minimum DBH for Pulpwood and Sawlog Calculations**

Volume Group	Pulpwood Minimum DBH	Sawlog Minimum DBH
WTP, HEM	8.0	12.0
SYP, SFi	8.0	10.0
JU	8.0	12.0
PBC, OAK	8.0	12.0
HWD, LGH	8.0	13.0

In Table 3:

WTP = eastern white pine

HEM = hemlock species

JU = redcedar species

SFi = spruce species, fir species

SYP = loblolly pine, shortleaf pine, table mountain pine, Virginia pine, pitch pine

PBC = yellow-poplar, cucumbertree, basswood species

OAK = northern red oak, white oak, black oak, black cherry, sugar maple, chestnut oak, white ash, black walnut

HWD = red maple, birch species, sweet birch, American beech, sycamore, buckeye/horsechestnut species

LGH = hickory species, black locust, scarlet oak, sourwood, blackgum, southern red oak, silverbell, hackberry species, sweetgum, Florida maple, boxelder, silver maple, American hornbeam, catalpa, eastern redbud, flowering dogwood, common persimmon, green ash, honeylocust, silverbell, American holly, southern magnolia, bigleaf magnolia, apple species, mulberry species, water tupelo, eastern hophornbeam, cottonwood species, bigtooth aspen, cherrybark oak, overcup oak, blackjack oak, swamp chestnut oak, chinkapin oak, water oak, post oak, willow species, sassafras, elm species, winged elm, American elm, other hardwood species, other species

## **Sustained Yield Limit Calculation**

The calculations for the sustained yield limit (SYL) involved the use of two nationally supported management models. In 2013 to 2014, the Forest Vegetation Simulator, an inventory-based (plots) growth and yield modeling system, was used to create yield profiles for forested land managed by the Pisgah and Nantahala NFs. Forest Inventory and Analysis (FIA) plots from across the southern Appalachian Mountains were used along with information on ecological zones, prominent forest health conditions, and common management prescriptions to develop the yield profiles representing information on 41 variables ranging from snags per acre to volumes harvested under simulated treatments. Refer to the project record for further information regarding FVS model development.

The annual SYL is 45.0 MMCF / 700,993 acres.



## Projected Wood Sale Quantity, Projected Timber Sale Quantity and Quantity of Timber Sold

To clearly display the intended timber program, the plan identifies the **projected wood sale quantity (PWSQ)** and the **projected timber sale quantity (PTSQ)**. The PWSQ is the estimated output of timber and all other wood products (such as fuelwood, firewood, or biomass) expected to be sold during the plan period for any purpose (except salvage harvest or sanitation harvest) on all lands in the plan area. The PTSQ is the portion of the PWSQ that is the quantity that meets applicable utilization standards. Both the PWSQ and the PTSQ are based on the fiscal capability and organizational capacity to achieve the desired conditions and objectives in the plan for the plan period. Fiscal capability and organizational capacity is based on current budget levels.

**Table B-3: Projected Wood Sale Quantity and Projected Timber Sale Quantity**

Sustained Yield Limit	45.0 MMCF*/year			
	First Decade		Second Decade	
	MMCF/ year	MMBF+ / year	MMCF/ year	MMBF/ year
<b>Timber Products</b> Volumes other than salvage or sanitation volumes that meet timber product utilization standards)				
<b>Lands suitable for timber production</b>	T1/T2	T1/T2	T1/T2	T1/T2
A1. Sawtimber	1.4/4.1	7.7/22.4	1.2/3.1	6.9/16.9
A2. Other products	2.0/5.8	11.0/31.9	1.8/4.4	9.8/24.1
<b>Lands NOT suitable for timber production</b>				
B1. Sawtimber	0/0.2	0.2/1.0	0/0.4	0.1/2.1
B2. Other products	0/0.3	0.2/1.4	0/0.6	0.2/3.0
<b>C. Projected Timber Sale Quantity (PTSQ)</b> (A1+A2+B1+B2)	3.4/10.4	19.1/56.7	3.0/8.5	17.0/46.1
<b>Other Wood Products (Est.)</b> Fuelwood, biomass, and other volumes that do not meet timber product utilization standards				
	MMCF	Tons	MMCF	Tons
D. Fuelwood	1.6	3,200	1.6	3,200
E. Posts	0.1	100	0.1	100
<b>F. Projected Wood Sale Quantity (PWSQ)</b>	5.2/12.1		4.8/10.2	

\*MMCF: Millions of cubic feet

+ MMBF: Millions of board feet

## Estimated Vegetation Management Practices

Section 65.1 of the 2012 planning rule requires that revised plans contain estimates of expected vegetation management practices. The planned practices shown below were modeled in the Environmental Impact Statement as a way to advance toward the plan's desired conditions and meet the plan's objectives, consistent with the other plan components. The plan must be revised at least once every 15 years. The average values are derived from Spectrum model estimated outputs, which were also used to derive the SYL, PTSQ, and PWSQ in tables above.

Estimated practices listed here are approximations and should not be related directly to future forest level treatment levels. The estimated practices are not a commitment to take an action or a proposal for such action, and variation may occur. The Tier 1 estimated practices are based on Forest's fiscal capability, while Tier 2 estimates what may be possible with additional resources and capacity. Refer to the Terrestrial Ecosystem and timber management sections of the forest plan for examples of priority treatments and design criteria

**Table B-4. Forestwide Vegetation Management Practices (Decade Level Estimate)**

Estimated Vegetation Management Practices by Moisture Class <sup>^</sup>	Average of First Two Decades (Acres)	
	Tier 1	Tier 2
Xeric Moisture Classes		
Even- aged & irregular shelterwood regeneration harvests <sup>β</sup>	1,845	3,932
Intermediate treatments	7,345	7,957
Prescribed Fire	116,266	239,434
Moderate Moisture Classes		
Even-aged & irregular shelterwood regeneration harvests <sup>β</sup>	2,681	17,411
Intermediate treatments	138*	3,935
Prescribed Fire	83,728	200,576
Moist Moisture Classes		
Even-aged & irregular shelterwood regeneration harvests <sup>β</sup>	3,726	6,808
Uneven-aged regeneration harvests	1,748	1,086
Intermediate treatments	0*	2,462
Prescribed Fire	0	0
<b>Total Treatments</b>		
All regeneration harvests	10,000	29,236
Intermediate treatments	7,483	14,354
Prescribed Fire	199,994	440,010

\* Though the Spectrum model did not identify measurable acres in the first two decades it is expected that intermediate treatments will be used on moist sites to address forest health, create structural diversity, or correct

changes in composition that moves away from desired conditions. Estimates could include up to 2,500 to 3,000 acres.

<sup>^</sup>Description of the forest communities within the reported moisture classes are located in the terrestrial ecosystem section of the forest plan.

<sup>β</sup> Irregular shelterwood regeneration methods represent an expansion of two-aged structure representing a range of age structures bridging between even-aged and balanced uneven-aged structures. Refer to the FEIS timber section for further details.

## Estimates of Culmination of Mean Annual Increment

On lands classified as suitable for timber production, the regeneration harvest of even-aged stands of trees is limited (although there are some exceptions) to stands that “generally have reached the culmination of mean annual increment (CMAI) of growth” (FSH 1909.12 64.26).

Based on forest plan revision FVS model development, estimations of CMAI were developed for the different forest type groups modeled. Refer to the FVS white paper in the project record to determine the number of plots contributing to each forest type groups CMAI estimate. These estimates are based on FIA plot data throughout the southern Appalachians. They should serve as a guide for Nantahala and Pisgah land managers when prescribing treatments. Always keep in mind those factors that contribute to stand development (i.e., site productivity) when comparing actual stands to modeled data results.

Typically, rotation ages for even age stands would have reached culmination of mean annual increment (CMAI) before regeneration harvests, however there may be opportunity for focused harvest of popular, white pine or red maple in order to meet other desired conditions.

**Table B-5. Modeled Culmination of Mean Annual Increment using FVS and FIA Data Across the Southern Blue Ridge**

Forest Type/Group	CMAI Age (Years)	Merchantable Volume (Cubic Feet/Acre/Year)
White Pine	68	82.6
Shortleaf Pine	48	95.1
Pitch/Virginia Pine	78	50.6
White Pine/HWD	75	60
Shortleaf Pine/HWD	104	43.3
Pitch/Virginia Pine/HWD	69	60.3
Dry Oak	98	39.6
Intermediate Oak	94	43.5
Cove Hardwoods	73	72.8
Mixed Hardwoods	92	56.1
Northern Hardwoods	94	52.7

## **Accompanying Documents: Final Environmental Impact Statement for the Nantahala and Pisgah National Forests Land Management Plan and Appendices**

The Final Environmental Impact Statement analyzes alternatives for implementing the forest plan and the impacts on forest resources. The FEIS includes multiple appendices, including:

- EIS Appendix A- Response to Comments Received at Draft
- EIS Appendix B – Description of the Analysis Process
- EIS Appendix C – Ecological Sustainability Analysis
- EIS Appendix D – Analysis of At-Risk Species
- EIS Appendix E – Wilderness Evaluation Process
- EIS Appendix F – Wild and Scenic River Evaluation Process
- EIS Appendix G – Coordination with Other Planning Efforts
- EIS Appendix H – Public Involvement
- EIS Appendix I – Maps

## Acronyms and Glossary

### Acronyms

ATV - all-terrain vehicle	FVS - Forest Vegetation Simulator
ANST – Appalachian National Scenic Trail	GA – Geographic Area
BA - basal area	GIS - Geographic Information System
BMP - best management practice	HUC - Hydrologic Unit Code
BRP- Blue Ridge Parkway	IDT - Interdisciplinary Team
CCF - hundred cubic feet	LMP - Land Management Plan
CEQ - Council on Environmental Quality	LWD - Large Woody Debris
CFR - Code of Federal Regulations	MA - management area
CFS - cubic feet per second	MBF - thousand board feet
CIP - Capital Investment Program	MCF - thousand cubic feet
CMAI - culmination of mean annual increment	MMBF - million board feet
CWA - Clean Water Act	MMCF - million cubic feet
CWD - Coarse Woody Debris	MOU - memorandum of understanding
DBH - diameter at breast height	MVUM - Motor Vehicle Use Map
DC - Desired Conditions	NAAQS - National Ambient Air Quality Standards
DEIS - Draft Environmental Impact Statement	NEPA - National Environmental Policy Act
EA - Environmental Assessment	NF - National Forest
EIS - Environmental Impact Statement	NFMA - National Forest Management Act NFS - National Forest System
EPA - Environmental Protection Agency	NFSR - National Forest System Road
ESA - Endangered Species Act	NPS - National Parks Service
FEIS - Final Environmental Impact Statement	NRCS - Natural Resources Conservation Service
FIA - Forest Inventory and Analysis	NRI - Natural Resource Inventory
FMP - Fire Management Plan	NVUM - National Visitor Use Monitoring
FRCC - Fire Regime Condition Class	NWPS - National Wilderness Preservation System
FSH - Forest Service Handbook	OHV - off-highway vehicle
FSM - Forest Service Manual	PTSQ - Projected Timber Sale Quantity
FTE - full-time employee	RIM - Recreation Information Management

RMO - Road Management Objectives  
RNA - research natural area  
ROD - record of decision  
ROS - Recreation Opportunity Spectrum  
ROW - right-of-way  
SCC - Species of Conservation Concern  
SHPO - State Historic Preservation Officer  
SIO - Scenic Integrity Objective  
SMS - Scenery Management System  
SPMO – semi-primitive motorized  
SPNM – semi-primitive non-motorized  
SYL - Sustained Yield Limit  
T&E - threatened and endangered  
TAP - Transportation Analysis Process  
TSI - timber stand improvement  
USDA - U.S. Department of Agriculture  
USDI - U.S. Department of Interior  
USFWS - U.S. Fish and Wildlife Service  
USGS - U.S. Geological Survey  
WSA - wilderness study area

Definitions were taken from the following sources:

Code of Federal Regulations (CFR) Title 36, Forests, and Public Property, Chapter II, Forest Service, Department of Agriculture; Part 219, Planning, Section A – National Forest System Land and Resource Management Planning; Section 219.19, Definitions, Revised April 9, 2012. (Referred to as 36 CFR 219.3)

Society of American Foresters. 1998. The Dictionary of Forestry. Edited by John A. Helms. 210 p. (Referred to as SAF)

Forest Service Handbook (FSH) 1909.12 Land Management Planning Handbook, WO Amendment 1909.12-2015-1 Effective date: 1/30/2015 05 - Definitions. (Referred to as FSH 1909.12)

Forest Service Handbook (FSH) 1909.12 Land Management Planning Handbook, WO Amendment 1909.12-2015-1 Effective date: 1/30/2015 Chapter 10, Section 12.13. (Referred to as FSH 1909.12)

Forest Service Handbook (FSH) 2090.11, Ecological Classification and Inventory Handbook, WO Amendment 2090.11-91-1, Effective 4/26/91, 05 - Definitions. (Referred to as FSH 2090.11-05)

FSH 2409.13, Timber Resource Planning Handbook, WO Amendment 2409.13-92-1, Effective 8/3/92, 05 - Definitions. (Referred to as FSH 2409.13-05)

FSH 2409.15, Timber Sale Administration Handbook, Amendment No. 2409.15-96-2, Effective Sept. 19, 1996, 05 - Definitions. (Referred to as FSH 2409.15-05)

FSH 2409.17, Silvicultural Practices Handbook, 1/85 WO, Chapter 9 - Timber Stocking Guides and Growth Predictions, 9.05 - Definitions. (Referred to as FSH 2409.17-9.05)

FSH 2609.13, Wildlife and Fisheries Program Management Handbook, WO Amendment 2609.13-92-1, Effective 8/3/92, Chapter 70 - Analysis of Economic Efficiency of Wildlife and Fisheries Projects, 70.5 - Definitions. (Referred to as FSH 2609.70.5)

FSH 2709.12, Road Rights-of-Way Grants Handbook, 9/85 WO, Zero Code, 05 - Definitions. (Referred to as FSH 2709.12-05)

Forest Service Manual (FSM) 1900 - Planning, Amendment No. 1900-2009-2, Effective February 2, 2009 1905 - Definitions. (FSM 1905)

FSM 2200, Range Management, WO Amendment 2200-2205-8 Effective 09/09/2005, Chapter 2230, Grazing and Livestock Use Permit System, 2230.5 - Definitions. (Referred to as FSM 2230)

FSM 2300, Recreation, Wilderness, and Related Resource Management, Amendment

No. 2300-2009-2 Effective 11/04/2009. Chapter 2350, Trail, River and Similar Recreation Opportunities 2353.05 definitions (Referred to as FSM 2350)

FSM 2300, Recreation, Wilderness, and Related Resource Management, Amendment No. 2300-2008-1 Effective 07/25/2008. Chapter 2350, Trail, River and Similar Recreation Opportunities. Chapter 2360 Heritage Program Management 2360.05 definitions (Referred to as FSM 2360)

FSM 2500, Watershed and Air Management, Amendment No. 2500-2004-1 05/26/2004. Chapter 2520, Watershed Protection and Management. 2521.1 - Watershed Condition Assessment. 2521.05 - Definitions. (Referred to as FSM 2521)

FSM 2500, Watershed and Air Management, Amendment No. 2500-2004-1, Effective 05/26/2005. Chapter 2520, Watershed Protection and Management. FSM 2526 - Riparian Area Management. 2526.05 - Definitions. (Referred to as FSM 2526)

FSM 2500, Watershed and Air Management, Amendment No. 2500-2004-1, Effective 05/26/2005. Chapter 2520, Watershed Protection and Management. FSM 2527 Floodplain Management and Wetland Protection. 2527.05 - Definitions. (Referred to as FSM 2527)

FSM 2600, Wildlife, Fish, and Sensitive Plant Habitat Management, Amendment No. 2600- 2005-1 Effective 09/23/2005, Chapter 2670.5, Definitions. (Referred to as FSM 2670)

Glossary of Wildland Fire Terminology. National Wildfire Coordinating Group (NWCG) PMS 205 October 2014. This publication is published electronically by NWCG on the NWCG website at <http://www.nwcg.gov/pms/pms.htm>

## A

**accessibility** – The relative ease or difficulty of getting from or to someplace, especially the ability of a site, facility or opportunity to be used by persons of varying physical and mental abilities.

**acid deposition** – Rain, snow, or dry particulate matter containing high concentrations of acid anions (e.g. nitrate and sulfate), usually produced by atmospheric transformation of the byproducts of fossil fuel combustion. Precipitation with a pH lower than 5.0 is generally considered to be acidic.

**acid neutralizing capacity** – The total capacity of a water sample to neutralize acids, as determined by titration with a strong acid. Acid neutralizing capacity includes alkalinity (e.g. carbonate) plus base cations.



**acidification** – To convert into an acid or become acid.

**adaptive capacity.** The ability of ecosystems to respond, cope, or adapt to disturbances and stressors, including environmental change, to maintain options for future generations. As applied to ecological systems, adaptive capacity is determined by:

1. Genetic diversity within species in ecosystems, allowing for selection of individuals with traits adapted to changing environmental conditions.
2. Biodiversity within the ecosystem, both in terms of species richness and relative abundance, which contributes to functional redundancies.
3. The heterogeneity and integrity of ecosystems occurring as mosaics within broader-scaled landscapes or biomes, making it more likely that some areas will escape disturbance and serve as source areas for re-colonization.

**adaptive management** – An approach to natural resource management where actions are designed and executed and effects are monitored for the purpose of learning and adjusting future management actions, which improves the efficiency and responsiveness of management (36 CFR 219.16).

**administrative unit** – All the National Forest System lands where one forest supervisor has responsibility. The basic geographic management area within a Forest Service Region, station, or area.

**advance regeneration (reproduction)** – Seedlings or saplings that develop, or are present, in the understory.

**adverse effect** – An action that has an apparent direct or indirect adverse effect on the conservation and recovery of a species listed as threatened or endangered. Such actions include, but are not limited to:

- a. Any action that directly alters, modifies, or destroys critical or essential habitats or renders occupied habitat unsuitable for use by a listed species, or that otherwise affects its productivity, survival, or mortality.
- b. Any action that directly results in the taking of a listed species. See Title 50 Code of Federal Regulations, Section 17.3 for an explanation of what constitutes a taking.
- c. Any action involving the disposal of land that is essential to achieving recovery objectives.

**age class (cohort)** – A distinct aggregation of trees originating from a single natural disturbance or regeneration cutting.

**air quality class** – Three broad classifications used to prevent significant deterioration of air quality for all areas of the country.

- Class I - All areas where essentially any degradation of air quality would be considered significant deterioration.
- Class II - All areas where moderate degradation over baseline concentrations are allowed.
- Class III - All others.

**all-terrain vehicle (ATV)** – A type of off-highway vehicle that travels on three or more low-pressure tires; has handle-bar steering; is less than or equal to 50 inches in width; and has a seat designed to be straddled by the operator.

**appropriate management response** – The response to a wildland fire based on an evaluation of risks to firefighter and public safety. Circumstances under which the fire occurs, including weather and fuel conditions, natural and cultural resource management objectives, protection priorities, and values to be protected. The evaluation must also include an analysis of the context of the specific fire within the overall logic, geographic area, or national wildland fire situation.

**area of influence** – An area influenced by the management of the plan area that is used during the land management planning process to evaluate social, cultural, and economic conditions. The area is usually a grouping of counties.

**artificial regeneration (reproduction)** – Creation of a new age class by renewal of a tree crop by direct seeding, or by planting seedlings or cuttings.

**assessment** – An assessment is the identification and evaluation of existing information to support land management planning. Assessments are not decision-making documents, but provide current information on select topics relevant to the plan area, in the context of the broader landscape (36 CFR 219.19).

**at-risk species** – The set of at-risk species for planning purposes includes federally recognized threatened, endangered, proposed and candidate species, and species of conservation concern.

**authorized use** – Specific activity or occupancy, including a ski area, historical marker, or oil and gas lease, for which a special authorization is issued.

## **B**

**background** – The area after the middleground in a picture or landscape; generally over 4 miles distance from the viewer.

**basal area** – The area of the cross-section of a tree inclusive of bark at breast height (4.5 feet or 1.37 meters above the ground) most commonly expressed as square feet per acre or square meters per hectare. Used to measure the density of a stand of trees. For shrubs and herbs it is used to determine phytomass. Grasses, forbs, and shrubs usually measured at or less than 1

inch above soil level. Trees—the cross-section area of a tree stem in square feet commonly measured at breast height (4.5' above ground) and inclusive of bark, usually computed by using diameter at breast height (DBH), or tallied through the use of basal area factor angle gauge.

**best management practices for water quality (BMPs)** – Methods, measures, or practices selected by an agency to meet its nonpoint source control needs. BMPs include but are not limited to structural and nonstructural controls and operation and maintenance procedures. BMPs can be applied before, during, and after pollution-producing activities to reduce or eliminate the introduction of pollutants into receiving waters. (36 CFR 219.19)

**biological assessment** – A biological evaluation conducted for major federal construction projects requiring an environmental impact statement, in accordance with legal requirements under section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1536(c)). The purpose of the assessment and resulting document is to determine whether the proposed action is likely to affect an endangered, threatened, or proposed species.

**biological opinion** – An official report by the Department of the Interior, Fish and Wildlife Service (FWS) or the Department of Commerce, National Oceanic and Atmospheric Administration Fisheries Service (NOAA Fisheries) issued in response to a formal Forest Service request for consultation or conference. It states whether an action is likely to result in jeopardy to a species or adverse modification of its critical habitat.

**biomass** – Renewable organic material that comes from plants and animals. Potential biomass products from the forest include wood and wood processing wastes (firewood, wood pellets, and wood chips), lumber and furniture mill sawdust and waste, and black liquor from pulp and paper mills.

**board foot** – A unit of timber measurement equaling the amount of wood contained in an unfinished board 1 inch thick, 12 inches long, and 12 inches wide. Commonly, 1,000 board feet is written as 1 MBF, and 1,000,000 board feet is written as 1MMBF.

**browse** – Young twigs, leaves and tender shoots of plants, shrubs or trees that animals eat.

## C

**cable logging** – A term for any system involving transport of logs along, or by means of steel cables with the load being lifted partly or wholly off the ground.

**candidate species** – For U.S. Fish and Wildlife Service candidate species, a species for which the FWS possesses sufficient information on vulnerability and threats to support a proposal to list as endangered or threatened, but for which no proposed rule has yet been published by the U. S. Fish and Wildlife Service.

**canopy cover** – The percent of a fixed area covered by the crown of an individual plant species or delimited by the vertical projection of its outermost perimeter. Small openings in the crown are included. Used to express the relative importance of individual species within a vegetation community, or to express the canopy cover of woody species. Canopy cover may be used as a measure of land cover change or trend. Often used for wildlife habitat evaluations.

**carbon density** – An estimate of forest carbon stocks per unit area.

**carbon pool** – Any natural region or zone, or any artificial holding area, containing an accumulation of carbon or carbon-bearing compounds or having the potential to accumulate such substances. Carbon pools may include live and dead above ground carbon, soil carbon including coarse roots, and harvested wood products.

**carbon sequestration** – The process by which atmospheric carbon dioxide is taken up by trees, grasses, and other plants through photosynthesis and stored as carbon in biomass (trunks, branches, foliage, and roots) and soils.

**carbon stocks** – The amount or quantity of carbon contained in a carbon pool. For purposes of carbon stock assessment for National Forest System (NFS) land management planning, carbon pools do not include carbon in fossil fuel resources, lakes or rivers, emissions from agency operations, or public use of NFS lands (such as emissions from vehicles and facilities).

**clearcutting** – A regeneration harvest method that removes essentially all trees in a stand producing a fully exposed microclimate for the development of a new age class of trees. A clearcut may or may not have reserve trees left to attain goals other than regeneration.

**clearcutting with reserves** – A two-aged regeneration method in which varying numbers of reserve trees are not harvested to attain goals other than regeneration.

**climate change adaptation** – Adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities. This adaption includes initiatives and measures to reduce the vulnerability of natural and human systems against actual or expected climate change effects.

**climax** – The culminating stage in plant succession for a given environment with the vegetation having reached a highly stable condition.

**closed road/trail** – A road that is closed for public use.

**co-dominant trees** – Trees or shrubs with crowns receiving full light from above, but comparatively little from the sides. Crowns usually form the general level of the canopy.

**cohort** – a group of trees developing after a single disturbance, commonly consisting of trees of similar age, although it can include a considerable range of tree ages of seeding or sprout origin and trees that predate the disturbance.

**collaboration** – A structured manner in which a collection of people with diverse interests share knowledge, ideas, and resources, while working together in an inclusive and cooperative manner toward a common purpose. (36 CFR 219.19).

**commercial forest land** – Forest land that can produce crops of industrial wood, and has not been withdrawn by Congress, the Secretary of Agriculture, or the Chief of the Forest Service. Existing technology and knowledge must be available to ensure timber production without irreversible damage to soils productivity, or watershed conditions. Adequate restocking can be attained within five years after final harvesting.

**commercial thinning** – Any type of thinning producing merchantable material at least equal to the value of the direct cost of harvesting.

**commodity outputs** – A resource output with commercial value. All resource products that are articles of commerce.

**compartment** – A portion of a forest under one ownership, usually contiguous and composed of a variety of forest stand types, defined for purposes of locational reference.

**composition (stand)** – The proportion of each tree species in a stand expressed as a percentage of the total number, basal area, or volume of all tree species in the stand.

**condition class** – Depiction of the degree of departure from historical fire regimes, possibly resulting in alternations of key ecosystem components. These classes categorize and describe vegetation composition and structure conditions that currently exist inside the Fire Regime Groups. Based on the coarse-scale national data, they serve as generalized wildfire rankings. The risk of loss of key ecosystem components from wildfires increases from Condition Class 1 (lowest risk) to Condition Class 3 (highest risk).

**connectivity** – Ecological conditions that exist at several spatial and temporal scales that provide landscape linkages that permit the exchange of flow, sediments, and nutrients; the daily and seasonal movements of animals within home ranges; the dispersal and genetic interchange between populations; and the long distance range shifts of species, such as in response to climate change. (36 CFR 219.19)

**conservation** – The protection, preservation, management, or restoration of natural environments, ecological communities, and species. (36 CFR 219.19)

**conversion (forest management)** – A change from one forest type to another in a stand on

land that has the capability of both forest types.

**critical habitat** – For a threatened or endangered species, (1) the specific areas within the geographical area occupied by the species, at the time it is listed in accordance with the provisions of section 4 of this Act, on which are found those physical or biological features (a) essential to the conservation of the species, and (b) which may require special management considerations or protection; and (2) specific areas outside the geographical area occupied by the species at the time it is listed in accordance with the provisions of section 4 of this Act, upon a determination by the Secretary that such areas are essential for the conservation of the species.(ESA §3(5)). Critical habitat is designated through rulemaking by the Secretary of the Interior or Commerce.

**critical minerals** – A mineral identified by the Secretary of the Interior to be (i) a non-fuel mineral or mineral material essential to the economic and national security of the United States, (ii) the supply chain of which is vulnerable to disruption, and (iii) that serves an essential function in the manufacturing of a product, the absence of which would have significant consequences for our economy or our national security (Executive Order 13817, 2017).

**culmination of mean annual increment of growth** – See “Mean annual increment of growth.”

**current old growth** – the term used to describe forests that currently contain the old growth characteristics. These forests are sometimes called existing old growth.

## D

**daylighting** – The practices of cutting back edges of roads or trails by removing shrub and tree growth.

**den trees** – Trees having rainproof, weather- tight cavities used by wildlife.

**designated area** – An area or feature identified and managed to maintain its unique special character or purpose. Some categories of designated areas may be designated only by statute and some categories may be established administratively in the land management planning process or by other administrative processes of the Federal executive branch. Examples of statutorily designated areas are national heritage areas, national recreational areas, national scenic trails, wild and scenic rivers, wilderness areas, and wilderness study areas. Examples of administratively designated areas are experimental forests, research natural areas, scenic byways, botanical areas, and significant caves. (36 CFR 219.19)

**designated old growth network** – Lands recognized as a network of large, medium, and

small patches that will either perpetuate or evolve towards old growth conditions over time. These patches are not limited to existing old growth but include lands that will become old growth and may currently be in earlier seral stages.

**desired conditions** – For the purposes of the land management planning regulation at 36 CFR part 219 and this Handbook, a description of specific social, economic, and/or ecological characteristics of the plan area, or a portion of the plan area, toward which management of the land and resources should be directed. Desired conditions must be described in terms that are specific enough to allow progress toward their achievement to be determined, but do not include completion dates (36 CFR 219.7(e)(1)(i)). Desired conditions are achievable, and may reflect social, economic, or ecological attributes, including ecosystem processes and functions.

**developed recreation** – Recreation use or opportunities occurring at developed sites.

**developed recreation site** – A discrete place containing a concentration of facilities and services used to provide recreation opportunities to the public and evidencing a significant investment in facilities and management under the direction of an administrative unit in the National Forest System.

**development scale** – An indication of site modification based on classes in the Recreation Opportunity Spectrum. Development Scale 1 equates to Primitive, with minimum site modification; 2 equates to Semi-Primitive Motorized/Nonmotorized, with little site modification; 3 equates to Roaded, with moderate modification; 4 equates to Rural, with heavy site modification; and 5 relates to Urban, with a high degree of site modification.

**dispersed recreation** – Recreation opportunities or use occurring in the general forest area. Does not take place in developed sites.

**disturbance** – Any relatively discrete event in time that disrupts ecosystem, watershed, community, or species population structure and/or function and changes resources, substrate availability, or the physical environment. (36 CFR 219.19)

**disturbance regime** – A description of the characteristic types of disturbance on a given landscape; the frequency, severity, and size distribution of these characteristic disturbance types; and their interactions. (36 CFR 219.19)

## E

**early-successional habitat** – A vegetative condition typically characterized by low density to no tree canopy cover and an abundance of herbaceous and/or woody ground cover. This condition may include early-successional forest, maintained openings, pastures, and open woodlands.

**ecological integrity** – The quality or condition of an ecosystem when its dominant ecological characteristics (for example, composition, structure, function, connectivity, and species composition and diversity) occur within the natural range of variation and can withstand and recover from most perturbations imposed by natural environmental dynamics or human influence. (36 CFR 219.19)

**ecological restoration** - The structure, pattern, and ecological processes necessary to maintain or restore ecological conditions.

**Ecological sustainability evaluation (ESE) tool** – A strategic conservation planning tool used by the USFS Southern Region for forest planning.

**ecological sustainability** - In the context of the ESE tool, the capability of ecosystems to maintain ecological integrity.

**ecosystem** – A spatially explicit, relatively homogeneous unit of the Earth that includes all interacting organisms and elements of the abiotic environment within its boundaries. An ecosystem is commonly described in terms of its composition, structure, function, and connectivity (36 CFR 219.19).

**ecosystem diversity** – The variety and relative extent of ecosystems. (36 CFR 219.19)

**ecosystem services** – Benefits people obtain from ecosystems, including:

1. Provisioning services, such as clean air and fresh water, energy, food, fuel, forage, wood products or fiber, and minerals;
2. Regulating services, such as long term storage of carbon; climate regulation; water filtration, purification, and storage; soil stabilization; flood and drought control; and disease regulation;
3. Supporting services, such as pollination, seed dispersal, soil formation, and nutrient cycling; and
4. Cultural services, such as educational, aesthetic, spiritual, and cultural heritage values, recreational experiences, and tourism opportunities.

**ecozone** – An ecological zone, or *ecozone*, is the finest scaled unit of land that can support a specific plant community or plant community group

**eligible river** – A river segment that has been evaluated, and found to be free-flowing and, in combination with its adjacent land area, possesses one or more outstandingly remarkable values.

**endangered species** – Any species which is in danger of extinction throughout all or a significant portion of its range other than a species of the Class Insect determined by the



Secretary to constitute a pest whose protection under the provisions of this Act would present an overwhelming and overriding risk to man. [ESA §3(6)]

**endemic** – Species restricted to a particular geographic area. Usually limited to one or a few small streams or a single drainage.

**environmental assessment (EA)** – A public document that provides sufficient evidence and analysis for determining whether to prepare an EIS or a finding of no significant impact, aids an agency's compliance with the NEPA when no EIS is necessary, and facilitates preparation of a statement when one is necessary (40 CFR 1508.9; FSH 1909.15, chapter 40). (36 CFR 219.62)

**environmental impact statement (EIS)** – A detailed written statement as required by section 102(2)(C) of the National Environmental Policy Act (NEPA) of 1969 (40 CFR 1508.11; 36 CFR 220). (36 CFR 219.62)

**ephemeral stream.** A stream that flows only in direct response to precipitation in the immediate locality (watershed or catchment basin), and whose channel is at all other times above the zone of saturation.

**erosion** – The wearing away of the land surface by the action of wind, water, or gravity.

**essential habitat** – Habitat in which threatened and endangered species occur, but which has not been declared as critical habitat. Occupied habitat or suitable unoccupied habitat necessary for the protection and recovery of a federally designated threatened or endangered species.

**even-aged stand** – A stand of trees composed of a single age class (36 CFR 219.19).

**even-aged system** – A planned sequence of treatments designed to maintain and regenerate a stand with predominantly one age class. The range of tree ages is usually less than 20 percent of the rotation (length in years). Treatments include clearcutting, seed tree, shelterwood, and coppice regeneration methods.

**extirpation** – Extinction of a species from all or part of its range.

## F

**federally recognized Indian Tribe** – An Indian Tribe or Alaska Native Corporation, band, nation, pueblo, village, or community that the Secretary of the Interior acknowledges to exist as an Indian Tribe under the Federally Recognized Indian Tribe List Act of 1994, 25 U.S.C. 479a. (36 CFR 219.19)

**fire regime** – Description of the patterns of fire occurrences, frequency, size, severity, and sometimes vegetation and fire effects as well, in a given area or ecosystem. A fire regime is a

generalization based on fire histories at individual sites. Fire regimes can often be described as cycles because some parts of the histories usually get repeated, and the repetitions can be counted and measured, such as fire return interval.

**fire regime condition class** – Also referred to Fire Regime Current Condition Class. A qualitative measure classified into three classes describing the relative degree of departure from historical fire regimes, possibly resulting in alterations of key ecosystem components such as species composition, structural stage, stand age, canopy closure, and fuel loadings. An FRCC uses three condition classes to describe low departure (FRCC 1), moderate departure (FRCC 2) and high departure (FRCC 3).

**Fire Regime Groups** – 1 A classification of fire regimes into a discrete number of categories based on frequency and severity. The national, coarse-scale classification of fire regime groups commonly used includes five groups: I - frequent (0-35 years), low severity; II - frequent (0-35 years), stand replacement severity; III - 35-100+ years, mixed severity; IV - 35-100+ years, stand replacement severity; and V - 200+ years, stand replacement severity.

**fire use** – The combination of wildland fire use and prescribed fire application to meet resource objectives.

**fire return interval** – The number of years between two successive fire events for a given area; also referred to as fire-free interval or fire interval.

**fisheries habitat** – Streams, lakes, and reservoirs that support fish.

**focal species** – A small subset of species whose status permits inference to the integrity of the larger ecological system to which it belongs and provides meaningful information regarding the effectiveness of the plan in maintaining or restoring the ecological conditions to maintain the diversity of plant and animal communities in the plan area. Focal species would be commonly selected on the basis of their functional role in ecosystems. (36 CFR 219.19)

**forage** – All browse and non-woody plants that are available to livestock or game animals used for grazing or harvested for feeding.

**foreground** – The area between the viewer and the middle ground in a landscape; generally from 0 to ½ mile distance.

**forest health** – The perceived condition of a forest derived from concerns about factors as its age, structure, composition, function, vigor, presence of unusual levels of insects or disease, and resilience to disturbance.

**forest land** – Land at least 10 percent occupied by forest trees of any size or formerly having had such tree cover and not currently developed for non-forest uses.

**forest road** – A road wholly or partly within or adjacent to and serving the National Forest System (NFS) that the Forest Service determines is necessary for the protection, administration, and utilization of the NFS and the use and development of its resources (36 CFR 212.1).

**Forest Service Handbook (FSH)** – A handbook that provides detailed instructions for proceeding with specialized phases of programs or activities for Forest Service use.

**Forest Service Manual (FSM)** – Agency manuals that provide direction for Forest Service activities.

**forest supervisor** – The official responsible for administering the National Forest System lands in a Forest Service administrative unit. It may consist of two or more national forests or all the forests within a state. The supervisor reports to the regional forester.

**forest type** – A classification of forest land based upon and named for the tree species that forms the plurality of live-tree stocking. A forest type classification for a field location indicates the predominant live-tree species cover for the field location; hardwoods and softwoods are the first group to be determine predominant group, and Forest Type is selected from the predominant group.

**forest type group** – A combination of forest types that share closely associated species or site requirements.

**fuel break** – Any natural or constructed barrier used to segregate, stop, and control the spread of fire, or to provide a control line from which to work.

**fuel treatment** – The rearrangement or disposal of fuels to reduce fire hazard. Fuels are defined as living and dead vegetative materials consumable by fire.

**fuels management** – The planned treatment of fuels to achieve or maintain desired fuels conditions.

**future old growth** – Forest stands or patches allocated to old growth through land management decisions, that do not currently meet one or more of the old-growth criteria in the operational definitions.

## G

**game species** – Any species of wildlife or fish for which seasons and bag limits have been prescribed, and which are normally harvested by hunters, trappers, and fishermen under state or federal laws, codes, and regulations.

**geographic area** – A spatially contiguous land area identified within the planning area. A geographic area may overlap with a management area (36 CFR 219.19).

**goals** – An optional plan component that are broad statements of intent, other than desired conditions, usually related to process or interaction with the public. Goals are expressed in broad, general terms, but do not include completion dates (36 CFR part 219.7(e)(2)).

**Geographic Information System** – An information processing technology to input, store, manipulate, analyze, and display spatial resource data to support the decision-making processes of an organization. Generally, an electronic medium for processing map information, typically used with manual processes to affect specific decisions about land base and its resources.

**groundwater** – Water in a saturated zone in a geologic stratum. Water stored below the water table where the soil (or other geologic material) is saturated.

**growing season burning** – Prescribed burning or use of wildland fire during the photosynthetically-active growing season, where live fuel moistures are relatively high and the dominant vegetation, grasses, forbs, and herbaceous vegetation are fully greened.

**group selection** – An uneven-aged regeneration method in which trees are removed periodically in small groups. Uneven age classes for trees are established in small groups. The width of groups is about twice the height of the mature trees, with small opening providing microenvironments suitable for tolerant regeneration, and the larger openings providing conditions suitable for more intolerant regeneration.

**guidelines** – A guideline is a constraint on project and activity decision making that allows for departure from its terms, so long as the purpose of the guideline is met. (§ 219.15(d)(3)). Guidelines are established to help achieve or maintain desired condition or conditions, to avoid or mitigate undesirable effects, or to meet applicable legal requirements.

## H

**harvesting method** – A procedure by which a stand is logged. Emphasis is on meeting logging requirements rather than silvicultural objectives.

**herbicide** – A pesticide used for killing or controlling the growth of undesirable plants.

**highly erodible soils** –Cropland, hayland, or pasture that can erode at excessive rates. Soils that have an erodibility index of eight or more (USDA NRCS definition).

**historic properties** – Any prehistoric or historic district, site, building, structure, or object

included in, or eligible for inclusion in, the National Register of Historic Places. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register criteria. (36 CFR 800.16)

**hydrologic condition** – The current state of the processes controlling the yield, timing and quality of water in a watershed.

**hydrologic function** – The behavioral characteristics of a watershed described in terms of ability to sustain favorable conditions of water flow. Favorable conditions of water flow are defined in terms of water quality, quantity, and timing.

**hydric soils** – Soils developed in conditions where soil oxygen is limited by the presence of saturated soil for long periods during the growing season.

I

**immediate foreground** – The area in the landscape from the viewer out to 300 feet distance.

**indicator** – A measure or measurement of an aspect of a sustainability criterion. A quantitative or qualitative variable that can be measured or described and, when observed periodically, shows trends. Indicators are quantifiable performance measures of outcomes or objectives for attaining criteria designed to assess progress toward desired conditions.

**infestation** – The attack by macroscopic organisms in considerable concentration. Examples are infestations of tree crowns by budworm, timber by termites, soil or other substrates by nematodes or weeds.

**INFRA infrastructure** – An integrated database for collection/storage/use of information about features, land units, facilities and utilities, accessibility and real property.

**inherent capability of the plan area** – The ecological capacity or ecological potential of an area characterized by the interrelationship of its physical elements, its climatic regime, and natural disturbances (36 CFR 219.19).

**in-stream flow** – The presence of adequate stream flow in channels necessary to maintain the integrity of the stream channel, and protection of downstream beneficial uses including fish and wildlife needs, outdoor recreation uses of water, and livestock watering needs.

**integrated pest management** – A process for selecting strategies to regulate forest pests in which all aspects of a pest-host system are studied and weighed.

**integrated resource management** – Multiple use management that recognizes the interdependence of ecological resources and is based on the need for integrated consideration of ecological, social, and economic factors. (36 CFR 219.19)

**interdisciplinary team** – A group of resource specialists (e.g.: forester, wildlife biologist, hydrologist, etc.) responsible for developing the Forest Plan/Environmental Statement, and for making recommendations to the forest supervisor.

**intermediate treatments** – A collective term for any treatment designed to enhance growth, quality, vigor, and composition of the stand after establishment of regeneration and prior to final harvest.

**intermittent stream** – A stream or reach of stream channel that flows, in its natural condition, only during certain times of the year or in several years, and is characterized by interspersed, permanent surface water areas containing aquatic flora and fauna adapted to the relatively harsh environmental conditions found in these types of environments. Intermittent streams are identified as dashed blue lines on USGS 7 1/2-inch quadrangle maps.

**interpretive services** – Visitor information services designed to present inspirational, educational, and recreational values to forest visitors in an effort to promote understanding, appreciation, and enjoyment of their forest experience.

**intolerant** – A plant requiring sunlight and exposure for establishment and growth.

**invasive species** – An alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health. A species that causes, or is likely to cause, harm and that is exotic to the ecosystem it has infested. Invasive species infest both aquatic and terrestrial areas and can be identified within any of the following four taxonomic categories: Plants, Vertebrates, Invertebrates, and Pathogens (Executive Order 13112).

**inventoried roadless area** – Areas identified in a set of inventoried roadless area maps, contained in the Forest Service Roadless Area Conservation, Final Environmental Impact Statement, Volume 2, dated November 2000, and any subsequent update or revision of those maps through the land management planning process (36 CFR 294.11).

## K

**key ecosystem characteristics** – Important specific elements of an ecosystem that sustain the long-term integrity of the ecosystems (FSH 1909, Chapter 10, Assessment sec. 12.14).

**key ecosystem services** – Ecosystem services provided by the plan area that are important in

the broader landscape outside the plan area and are likely to be influenced by the land management plan.

## L

**land exchange** – The conveyance of non-federal land or interests in the land in exchange for National Forest System land or interests in land.

**landing** – A cleared area in the forest to which logs are yarded or skidded for loading onto trucks for transport.

**landline location** – Legal identification and accurate location of national forest property boundaries.

**lands that may be suitable for timber production** – A preliminary classification in the process of determining lands that are suited for timber production. This preliminary classification excludes National Forest System lands that are not suitable for timber production based on the factors identified in 36 CFR 219.11.

**landscape character** – Particular attributes, qualities, and traits of landscape that give it an image and make it identifiable or unique.

**large woody debris (LWD)** – Logs, sticks, branches, and other wood that falls into streams and rivers. This debris can influence the flow and the shape of the stream channel.

**late- seral (successional) stage** – The stage of forest development at which overstory trees have attained most of expected height growth and have reached ecological maturity. As used in the Environmental Impact Statement and the Forest Plan, this successional stage is generally defined by stand ages greater than 80 years for most hardwood types, and by stand ages greater than 60 years for most pine types. Old-growth forests occur during the later periods of this seral stage at ages that vary by forest type and in response to a variety of environmental conditions. See successional stage.

**lease** – A contract between the landowner and another granting the latter the right to search for and produce oil, gas, or other mineral substances (as specified in the document) on payment of an agreed rental, bonus, or royalty. This right is subject to the terms, conditions, and limitations specified in the document.

**line officer** – A Forest Service official who serves in a direct line of command from the Chief. (36 CFR 219.62)

**M**

**management area** – A land area identified within the planning area that has the same set of applicable plan components. A management area does not have to be spatially contiguous. (36 CFR 219.19)

**management practices (vegetation management practices)** – Silvicultural practices such as reforestation, prescribed fire, thinning to reduce stand density, and other practices designed to facilitate growth and development of trees.

**maintain** – In reference to an ecological condition: To keep in existence or continuance of the desired ecological condition in terms of its desired composition, structure, and processes. Depending upon the circumstance, ecological conditions may be maintained by active or passive management or both (36 CFR 219.19).

**mean annual increment of growth and culmination of mean annual increment of growth** – The mean annual increment of growth is the total increment of increase of volume of a stand (standing crop plus thinnings) up to a given age divided by that age. The culmination of mean annual increment of growth is the age in the growth cycle of an even-aged stand at which the average annual rate of increase of volume is at a maximum. In land management plans, the mean annual increment of growth is expressed in cubic measure and is based on the expected growth of stands according to intensities and utilization guidelines in the plan (36 CFR 219.19).

**mast tree** – Generally hardwood trees of the heavy seeded variety including oaks, hickories, walnut, beech—25 years and older capable of producing frequent seed crops to feed a variety of wildlife species.

**mature timber** – The stage at which a crop or stand of trees best fulfills the main purpose for which it was grown.

**mean annual increment of growth** – The total increase in girth, diameter, basal area, height, or volume of individual trees or a stand up to a given age divided by that age.

**mechanical site preparation** – Soil disturbance by mechanical chopping, furrowing, dozing, or disking to prepare areas for reforestation. Objective is to reduce plant competition for trees to be planted.

**mesic** – Sites or habitats characterized by intermediate moisture conditions, i.e., neither decidedly wet or dry.

**middle ground** – The space between the foreground and the background in a picture or landscape; generally ½ mile to 4 miles distance from the viewer.

**mineral exploration** – The search for valuable minerals on lands open to mineral entry.



**mineral resource** – A known or undiscovered concentration of naturally occurring solid, liquid, or gaseous material in or on the earth's crust in such form and amount that economic extraction of a commodity from the concentration is currently or potentially feasible.

**minerals (leasable)** – Federally managed minerals governed by the Mineral Leasing Act of 1920, as amended, or the Mineral Leasing Act for Acquired Lands of 1947, and include energy minerals such as oil, gas and coal, and other mineral commodities such as phosphate, potassium, sodium, gilsonite, oil shale, and sulphur.

**minerals (salable)/mineral materials** – Minerals that can be sold under a mineral material contract, and are common. These minerals are relatively low value per volume, for example: sand, gravel, cinders, common building stone, and flagstone.

**mitigate** – To avoid, minimize, rectify, reduce, or compensate the adverse environmental impacts associated with an action.

**monitoring** – A systematic process of collecting information to evaluate effects of actions or changes in conditions or relationships. (36 CFR 219.19)

**Motor Vehicle Use Map (MVUM)** – The Motor Vehicle Use Map (MVUM) is a requirement of the Travel Management Final Rule and reflects travel management decisions on each National Forest and National Grassland. The MVUM displays National Forest System (NFS) routes (roads and trails) or areas designated open to motorized travel. The MVUM also displays allowed uses by vehicle class (highway-legal vehicles, vehicles less than 50 inches wide and motorcycles); seasonal allowances; and other travel rule and regulation information. Routes not shown on the MVUM are not open to public motor vehicle travel. Routes designated for motorized use may not always be signed on the ground but will be identified on the MVUM.

**Multiple use** – The management of all the various renewable surface resources of the NFS so that they are utilized in the combination that will best meet the needs of the American people; making the most judicious use of the land for some or all of these resources or related services over areas large enough to provide sufficient latitude for periodic adjustments in use to conform to changing needs and conditions; that some land will be used for less than all of the resources; and harmonious and coordinated management of the various resources, each with the other, without impairment of the productivity of the land, with consideration being given to the relative values of the various resources, and not necessarily the combination of uses that will give the greatest dollar return or the greatest unit output, consistent with the Multiple-Use Sustained-Yield Act of 1960 (16 U.S.C. 528–531) (36 CFR 219.19).

**N**

**National Environmental Policy Act (NEPA) of 1969** – An act to declare a national policy that will encourage productive and enjoyable harmony between humankind and the environment. It was created to promote efforts that will prevent or eliminate damage to the environment, biosphere, and stimulate the health and welfare of humanity. In addition, the act was crafted to enrich the understanding of the ecological systems and natural resources important to the nation, and establish a Council of Environmental Quality.

**National Forest Land and Resource Management Plan (Forest Plan)** – A plan developed to meet the requirements of the Forest and Rangeland Renewable Resources Planning Act of 1974, as amended, that guides all natural resource management activities and establishes management standards and guidelines for the National Forest System lands of a given national forest.

**National Forest Management Act (NFMA) of 1976** – Act passed as an amendment to the Forest and Rangeland Renewable Resources Planning Act, requiring the preparation of regional guides and forest plans, and the preparation of regulations to guide them.

**National Forest System** – All National Forest lands reserved or withdrawn from the public domain of the United States; all National Forest lands acquired through purchase, exchange, donation, or other means.

**National Forest System road** – A forest road other than a road which has been authorized by a legally documented right-of-way held by a state, county, or local public road authority (36 CFR 212.1).

**National Forest System trail** – A forest trail other than a trail which has been authorized by a legally documented right-of-way held by a state, county, or local public road authority (36 CFR 212.1).

**National Recreation Trails** – Trails designated by the Secretary of the Interior or the Secretary of Agriculture as part of the national system of trails authorized by the National Trails System Act. National recreation trails provide a variety of outdoor recreation uses, in or reasonably accessible, to urban areas.

**National Register of Historic Places** – The National Register of Historic Places is the Nation's official list of cultural resources worthy of preservation. Authorized under the National Historic Preservation Act of 1966, the National Register is part of a national program to coordinate and support public and private efforts to identify, evaluate, and protect our historic and archeological resources. Properties listed in the Register include districts, sites, buildings, structures, and objects that are significant in American history, architecture, archeology, engineering, and culture.

**National Visitor Use Monitoring (NVUM)** – A systematic process to estimate annual

recreation and other uses of National Forest lands through user surveys.

**National Wild and Scenic Rivers System** – Rivers with scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values designated by Congress under the Wild and Scenic Rivers Act of Oct. 2, 1968, for preservation of their free-flowing condition.

**National Wilderness Preservation System** – All lands covered by the Wilderness Act and subsequent wilderness designations, irrespective of the department or agency having jurisdiction.

**native knowledge** – A way of knowing or understanding the world, including traditional, ecological, and social knowledge of the environment derived from multiple generations of indigenous peoples' interactions, observations, and experiences with their ecological systems. Native knowledge is place-based and culture-based knowledge in which people learn to live in and adapt to their own environment through interactions, observations, and experiences with their ecological system. This knowledge is generally not solely gained, developed by, or retained by individuals, but is rather accumulated over successive generations and is expressed through oral traditions, ceremonies, stories, dances, songs, art, and other means within a cultural context (36 CFR 219.19).

**native species** – An organism that was historically or is present in a particular ecosystem as a result of natural migratory or evolutionary processes; and not as a result of an accidental or deliberate introduction into that ecosystem. An organism's presence and evolution (adaptation) in an area are determined by climate, soil, and other biotic and abiotic factors. (36 CFR 219.19)

**natural range of variation (NRV)** –The variation of ecological characteristics and processes over scales of time and space that are appropriate for a given management application. In contrast to the generality of historical ecology, the NRV concept focuses on a distilled subset of past ecological knowledge developed for use by resource managers; it represents an explicit effort to incorporate a past perspective into management and conservation decisions (adapted from Weins, J.A. et al., 2012 ). The pre-European influenced reference period considered should be sufficiently long, often several centuries, to include the full range of variation produced by dominant natural disturbance regimes such as fire and flooding and should also include short-term variation and cycles in climate. The NRV is a tool for assessing the ecological integrity and does not necessarily constitute a management target or desired condition. The NRV can help identify key structural, functional, compositional, and connectivity characteristics, for which plan components may be important for either maintenance or restoration of such ecological conditions.

**natural regeneration** – An age class created from natural seeding, sprouting, suckering, or layering.

**non-commodity output** – A resource output that cannot be bought and sold.

**non-forest land** – Land that has never supported forests and lands formerly forested where use for timber utilization is precluded by development for other use. Lands that never have had, or that are incapable of having 10 percent or more of the area occupied by forest trees; or lands previously having such cover and currently developed for non-forest use.

**non-point source pollution** – A diffuse source of pollution not regulated as a point source. May include atmospheric, deposition, agricultural runoff, and sediment from land-distributing activities.

**non-timber forest products** – All forest products except timber, including resins, oils, leaves, bark, plants other than trees, fungi, and animals or animal products.

## O

**old forest** – forest lands that met the minimum age threshold to be considered old seral state, but these lands may or may not have other characteristics of old growth.

## P

**partnership** – Voluntary, mutually beneficial and desired arrangement between the Forest Service and another or others to accomplish mutually agreed-on objectives consistent with the agency's mission and serving the public's interest.

**payments in lieu of taxes** – Payments to local or state governments based on ownership of federal land, and not directly dependent on production of outputs or receipt sharing.

**perennial stream** – A stream or reach of a channel that flows continuously or nearly so throughout the year and whose upper surface is generally lower than the top of the zone of saturation in areas adjacent to the stream. These streams are identified as solid blue on the USGS 7 1/2-inch quadrangle maps.

**plan area** – The NFS lands covered by a forest plan. (36 CFR 219.19)

**plan or land management plan** – A document or set of documents that provide management direction for an administrative unit of the NFS developed under the requirements of this part or a prior planning rule. (36 CFR 219.19)

**plan monitoring program** – The program that defines plan monitoring questions and associated indicators, based on plan components. The plan monitoring program informs management of resources on the plan area and enables the responsible official to determine if a change in plan components or other plan content may be needed.

**planning record** – Includes documents that support analytical conclusions made and alternatives considered throughout the planning process. (36 CFR 219.14)(b)(2))

**pre-commercial thinning** – The selective felling, deadening, or removal of tree in a young stand not for immediate financial return, but primarily to accelerate diameter increment on the remaining stems. To maintain a specific stocking or stand density range, or to improve the vigor and quality of the remaining trees.

**prescribed fire** – Any fire intentionally ignited by management actions in accordance with applicable laws, policies, and regulations to meet specific objectives.

**proclamation boundary** – The boundary contained within the presidential proclamation that established the national forest.

**productivity** – The capacity of NFS lands and their ecological systems to provide the various renewable resources in certain amounts in perpetuity. For the purposes of this Handbook, productivity is an ecological term, not an economic term (36 CFR 219.19).

**projected timber sale quantity (PTSQ)** – The estimated quantity of timber meeting applicable utilization standards that is expected to be sold during the plan period. As a subset of the projected wood sale quantity (PWSQ), the projected timber sale quantity includes volume from timber harvest for any purpose from all lands in the plan area based on expected harvests that would be consistent with the plan components. The PTSQ is also based on the planning unit's fiscal capability and organizational capacity. PTSQ is not a target nor a limitation on harvest, and is not an objective unless the responsible official chooses to make it an objective in the plan.

**projected wood sale quantity (PWSQ)** – The estimated quantity of timber and all other wood products that is expected to be sold from the plan area for the plan period. The PWSQ consists of the projected timber sale quantity as well as other woody material such as fuelwood, firewood, or biomass that is also expected to be available for sale. The PWSQ includes volume from timber harvest for any purpose based on expected harvests that would be consistent with the plan components. The PWSQ is also based on the planning unit's fiscal capability and organizational capacity. PWSQ is not a target nor a limitation on harvest, and is not an objective unless the responsible official chooses to make it an objective in the plan.

**proposed action** – In terms of the National Environmental Policy Act, the project, activity, or decision that a federal agency intends to implement or undertake. The proposed action described in the Environmental Impact Statement is the Forest Plan.

**proposed species** – Any species of fish, wildlife, or plant that is proposed by the U. S. Fish and Wildlife Service or the National Marine Fisheries Service in the Federal Register to be

listed under Section 4 of the Endangered Species Act. (36 CFR 219.19)

**pulpwood** – Wood cut and prepared primarily for manufacture into wood pulp.

## R

**rare species** – Any native or once-native species of wild animal which exists in small numbers and has been determined to need monitoring. May include peripheral species.

**reclamation** - the act or process of reclaiming: the state of being reclaimed. The Forest Service manages the reclamation of lands disturbed by mineral and associated activities in order to: 1) Minimize the environmental impacts resulting from such activities. 2) Ensure that disturbed lands are returned to a use that is consistent with long-term forest land and resource management plans.

**reconstruction** – Work that includes, but is not limited to, widening of roads, improving alignment, providing additional turnouts, and improving sight distance that improve the standard to which the road was originally constructed. Also undertaken to increase the capacity of the road or to provide greater traffic safety.

**record of decision** – A document separate from, but associated with an environmental impact statement that publicly and officially discloses the responsible official's decision on the alternative assessed in the environmental impact statement chosen to implement.

**recovery** – For the purposes of this Handbook and with respect to threatened or endangered species: The improvement in the status of a listed species to the point at which listing as federally endangered or threatened is no longer appropriate (36 CFR 219.19).

**recreation capacity** – A measure of the number of people a site can reasonably accommodate at one time; sometimes measured as 'persons at one time'.

**recreation opportunity** – An opportunity to participate in a specific recreation activity in a particular recreation setting to enjoy desired recreation experiences and other benefits that accrue. Recreation opportunities include non-motorized, motorized, developed, and dispersed recreation on land, water, and in the air (36 CFR 219.19).

**recreation opportunity spectrum** – A method for classifying types of recreation experiences available, or for specifying recreation experience objectives desired in certain areas. Classes are: Primitive, Semi-Primitive Non-Motorized, Semi-Primitive Motorized, Roded Natural, Rural, and Urban.

**recreation setting** – The social, managerial, and physical attributes of a place that, when combined, provides a distinct set of recreation opportunities. The Forest Service uses the

recreation opportunity spectrum to define recreation settings and categorize them into six distinct classes: primitive, semi-primitive non-motorized, semi-primitive motorized, roaded natural, rural, and urban. (36 CFR 219.19)

**recreation visit** – The entry of one person upon a National Forest to participate in recreation activities for an unspecified period of time. A NF visit can be composed of multiple site visits.

**reforestation** – The re-establishment of forest cover by seeding, planting, and natural means.

**regeneration** – The act of renewing of a tree crop by establishing young trees by naturally or artificially. The young crop itself.

**regeneration harvest** – Any removal of trees intended to assist in the regeneration of a new age class or to make regeneration of a new age class possible. Regeneration harvest may be through even-aged or uneven-aged methods.

**renewable energy** – Energy resources that are naturally replenishing but flow-limited. They are virtually inexhaustible in duration but limited in the amount of energy that is available per unit of time. Renewable energy resources include: biomass, hydro, geothermal, solar, wind, ocean thermal, wave action, and tidal action (USFS Strategic Energy Framework, 2011).

**reserve trees** – Trees, pole-sized or larger, retained after the regeneration period under the clearcutting, seed-tree, shelterwood, or coppice methods.

**reserved mineral rights** – Refers to those cases wherein the minerals were severed from the surface during the transaction whereby the government acquired the land. These rights are subject to the Secretary of Agriculture's rules and regulations that were applicable at the time of the transaction.

**resilience/resiliency** – The ability of an ecosystem and its component parts to absorb, or recover from the effects of disturbances through preservation, restoration, or improvement of its essential structures and functions and redundancy of ecological patterns across the landscape.

**restocked** – The condition of the growing space occupancy of trees to be achieved after a disturbance that has substantially altered the existing stocking (see definition of "Stocking").

**restoration, ecological** – The process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed. Ecological restoration focuses on reestablishing the composition, structure, pattern, and ecological processes necessary to facilitate terrestrial and aquatic ecosystems sustainability, resilience, and health under current and future conditions (36 CFR 219.19).

**restoration, functional** – Restoration of abiotic and biotic processes in degraded ecosystems. Functional restoration focuses on the underlying processes that may be degraded, regardless of the structural condition of the ecosystem. Functionally restored ecosystem may have a different structure and composition than the historical reference condition. As contrasted with ecological restoration that tends to seek historical reference condition, the functional restoration focuses on the dynamic processes that drive structural and compositional patterns. Functional restoration is the manipulation of interactions among process, structure, and composition in a degraded ecosystem to improve its operations. Functional restoration aims to restore functions and improve structures with a long-term goal of restoring interactions between function and structure. It may be, however, that a functionally restored system will look quite different than the reference condition in terms of structure and composition and these disparities cannot be easily corrected because some threshold of degradation has been crossed or the environmental drivers, such as climate, that influenced structural and (especially) compositional development have changed.

**restore** – To renew by the process of restoration. See restoration (36 CFR 219.19).

**revegetation** – The re-establishment and development of a plant cover. This may take place naturally through the reproductive processes of the existing flora or artificially through the direct action of humans (e.g.: afforestation and range reseeding).

**right-of-way (ROW)** – Public or National Forest System lands authorized to be used or occupied pursuant to a ROW grant or special use authorization.

**riparian areas** – Three-dimensional ecotones [the transition zone between two adjoining communities] of interaction that include terrestrial and aquatic ecosystems that extend down into the groundwater, up above the canopy, outward across the floodplain, up the near-slopes that drain to the water, laterally into the terrestrial ecosystem, and along the water course at variable widths (36 CFR 219.19).

**riparian ecosystems** – A transition area between the aquatic ecosystem and the adjacent terrestrial ecosystem; identified by soil characteristics or distinctive vegetation communities that require free or unbound water.

**river classifications (Wild and Scenic Rivers) –**

- (1) *Wild*: Rivers or sections of rivers that are free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and waters unpolluted. These represent vestiges of primitive America.
- (2) *Scenic*: Rivers or sections of rivers that are free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads.
- (3) *Recreational*: Rivers or sections of rivers that are readily accessible by road or



railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past.

**road** – A motor vehicle travelway over 50 inches wide, unless designated and managed as a trail. A road may be classified, unclassified or temporary.

**road maintenance levels** – A formally established set of objectives that describes the conditions necessary to achieve the planned operation of a road. The levels vary from Level I, basic custodial care, to Level V, which is assigned high use roads in which user safety and comfort are important considerations.

**rotation** – The number of years required to establish, including the regeneration period and grow timber crops, to a specified condition or maturity for harvest.

**runoff** – The total stream discharge of water from a watershed including surface and subsurface flow, but not groundwater. Usually expressed in acre-feet.

**rural** – A recreation opportunity spectrum classification for areas characterized by a substantially modified natural environment. Sights and sounds of man are evident. Renewable resource modification and utilization practices enhance specific recreation activities or provide soil and vegetative cover protection.

## S

**sacred site** – Indian Sacred Sites, defines an Indian Sacred Site as “any specific, discrete, narrowly delineated location on Federal land that is identified by an Indian tribe, or Indian individual determined to be an appropriately authoritative representative of an Indian religion, as sacred by virtue of its established religious significance to, or ceremonial use by, an Indian religion; provided that the Indian tribe or appropriately authoritative representative of an Indian religion has informed the agency of the existence of such a site.” (E.O. 13007)

**sawtimber** – Trees suitable in size and quality for producing logs that can be processed into dimension lumber.

**Scenery Management System** – An overall framework for the orderly inventory, analysis, and management of scenery (FSM 2382).

**scenic character** – A combination of the physical, biological, and cultural images that gives an area its scenic identity and contributes to its sense of place. Scenic character provides a frame of reference from which to determine scenic attractiveness and to measure scenic integrity. (36 CFR 219.19)

**scenic attractiveness** – The scenic importance of a landscape based on human perceptions of the intrinsic beauty of landform, rockform, waterform, and vegetation pattern. Classified as A (Distinctive), B (Typical or Common), or C (Undistinguished).

**scenic class** – A system of classification describing the importance or value of a particular landscape or portions of that landscape. Values range from 1 (highest value) to 7 (lowest value).

**scenic integrity objectives (SIOs) and landscape character goals** – These are developed for Forest Plan Management Areas. Scenic Integrity Objectives are Very High-unaltered, High-appears unaltered, Moderate-slightly altered, and Low-moderately altered. A desired level of excellence based on physical and sociological characteristics of an area. Refers to the degree of acceptable alterations of the characteristic landscape. Objectives include Very High, High, Moderate, and Low.

**sediment** – Solid mineral and organic material that is in suspension, is being transported, or has been moved from its site of origin by air, water, gravity, or ice.

**seed tree** – An even-aged regeneration method where in a single cut, the removal of all merchantable trees in a stand, except for a small number of widely dispersed trees retained for seed production, and to produce a new age class in a fully-exposed microenvironment.

**seep** – A wet area where a seasonal high water table intersects with the ground surface. Seeps that meet the definition of a wetland are included in the Riparian Corridor.

**seral stage** – A stage of secondary successional development (secondary succession refers to an ecological process of progressive changes in a plant community after stand-initiating disturbance).

**shelterwood** – A regeneration method of regenerating an even-aged stand in which a new age class develops beneath the partially shaped microenvironment provided by the residual trees.

**shelterwood with reserves** – A two-aged regeneration method in which some or all of the shelter trees are retained, well beyond the normal period of retention, to attain goals other than regeneration.

**silvicultural system** – A management process whereby forests are tended, harvested, and replaced, resulting in a forest of distinctive form. Systems are classified according to the method of carrying out the fellings that remove the mature crop, and provide for regeneration and according to the type of forest thereby produced.

**silviculture** – The art and science of controlling the establishment, growth, composition,

health, and quality of forests and woodlands. Silviculture entails the manipulation of forest and woodland vegetation in stands and on landscapes to meet the diverse needs and values of landowners and society on a sustainable basis.

**single-tree selection** – A regeneration method of creating new age classes in uneven-aged stands in which individual trees of all size classes are removed uniformly throughout the stand to achieve desired stand structural characteristics.

**site preparation** – The preparation of the ground surface prior to reforestation. Various treatments are applied as needed to control vegetation that will interfere with the establishment of the new crop of trees or to expose the mineral soil sufficiently for the establishment of the species to be reproduced.

**site index** – A series-specific measure of actual or potential forest productivity (site quality, usually for even-aged stands), expressed in terms of the average height of trees included in a specified stand component (defined as a certain number of dominants, co-dominants, or the largest and tallest trees per unit area) at a specified index or base age.

**site quality (productivity)** – The productive capacity of a site, usually expressed as volume production of a given species.

**skid trails** – A travel way through the woods formed by loggers dragging (skidding) logs from the stump to a log landing without dropping a blade and without purposefully changing the geometric configuration of the ground over which they travel.

**skidding** – A term for moving logs by dragging from stump to roadside, deck, or other landing.

**slash** – The residue left on the ground after felling, silvicultural operations, or as a result of storm, fire, girdling, or poisoning. All vegetative debris resulting from the purchaser's operations. Slash associated with construction of roads is subject to treatment according to construction specifications, all other is subject to the terms of contract provision B/BT6.7.

**snag** – A dead or partially dead (more than 50 percent) hardwood or pine tree which is used by many bird species for perching, feeding, or nesting.

**soil productivity** – The inherent capacity of a soil to support the growth of specified plants, plant communities, or a sequence of plant communities. Soil productivity may be expressed in terms of volume or weight/unit area/year, percent plant cover, or other measures of biomass accumulation.

**soil survey** – A term for the systematic examination of soils in the field and in laboratories; their description and classification; the mapping of kinds of soil; the interpretation of soils according to their adaptability for various crops, grasses, and trees; their behavior under

use of treatment for plant production or for other purposes; and their productivity under different management systems.

**special-use authorization** – A permit, term permit, or easement that allows occupancy, use, rights, or privileges of National Forest System land.

**special use permit** – A permit issued under established laws and regulations to an individual, organization, or company for occupancy or use of National Forest land for some special purpose.

**species groups** – a group of species that are associated with the same habitat conditions. Groupings are made based on the ecological conditions necessary to maintain or, in the case of federally listed threatened or endangered species, recover each group member.

**species of conservation concern** – A species of conservation concern is a species, other than federally recognized threatened, endangered, proposed, or candidate species, that is known to occur in the plan area and for which the regional forester has determined that the best available scientific information indicates substantial concern about the species' capability to persist over the long-term in the plan area. (36 CFR 219.9(c))

**spring** – A water source located where water begins to flow from the ground due to the intersection of the water table with the ground surface. Generally flows throughout the year. Springs that are the source of perennial or intermittent streams are included in the Riparian Corridor.

**stand** – A contiguous group of trees sufficiently uniform in age class distribution, composition, and structure, and growing on a site of sufficiently uniform quality, to be a distinguishable unit, such as mixed, pure, even-aged, and uneven-aged stands.

**stand density** – A quantitative measure of stocking expressed either absolutely per unit of land in terms of number of trees, basal area, volume per unit area, or relative to some standard condition.

**stand improvement** – A term comprising all intermediate cuttings made to improve the composition, structure, condition, health, and growth of even-aged, two-aged, or uneven-aged stands.

**standards** – A standard is a mandatory constraint on project and activity decision making, established to help achieve or maintain the desired condition or conditions, to avoid or mitigate undesirable effects, or to meet applicable legal requirements.

**stocking** – An indication of growing space occupancy of trees relative to plan-defined desired conditions for the stand or area. Common indices of stocking include the number of trees by

size and spacing, percent occupancy, basal area, relative density or crown completion factor.

**streamside zones** – Landscape unit that includes riparian areas and adjacent lands that mitigate the movement of sediment, nutrients, and other chemicals from upland forest and agricultural management areas into streams.

**stressors** – Actors that may directly or indirectly degrade or impair ecosystem composition, structure, or ecological process in a manner that may impair its ecological integrity, such as an invasive species, loss of connectivity, or the disruption of a natural disturbance regime (36 CFR 219.19).

**stocking** – An indication of growing space occupancy of trees relative to plan-defined desired conditions for the stand or area. Common indices of stocking include the number of trees by size and spacing, percent occupancy, basal area, relative density or crown completion factor.

**successional stage** – A period, marked by distinctiveness of structure, in the development of a forest community from establishment of tree regeneration to advanced age.

**supply** – The amount of a good or service that producers are willing to provide at a specified price, time period, and conditions of sale.

**suitability of lands** – A determination that specific lands within a plan area may be used, or not, for various multiple uses or activities, based on the desired conditions applicable to those lands. The suitability of lands determinations need not be made for every use or activity, but every plan must identify those lands that are not suitable for timber production.

**sustainability** – The capability to meet the needs of the present generation without compromising the ability of future generations to meet their needs. For the purposes of this Handbook “ecological sustainability” refers to the capability of ecosystems to maintain ecological integrity; “economic sustainability” refers to the capability of society to produce and consume or otherwise benefit from goods and services including contributions to jobs and market and nonmarket benefits; and “social sustainability” refers to the capability of society to support the network of relationships, traditions, culture, and activities that connect people to the land and to one another, and support vibrant communities (36 CFR 219.19).

**sustainable recreation** – The set of recreation settings and opportunities on the National Forest System that is ecologically, economically, and socially sustainable for present and future generations. (36 CFR 219.19)

**sustained yield limit (SYL)** – The amount of timber, meeting applicable utilization standards, “which can be removed from [a] forest annually in perpetuity on a sustained-yield basis”

(NFMA at section 11, 16 USC 1611; 36 CFR 219.11(d)(6))). It is the volume that could be produced in perpetuity on lands that may be suitable for timber production. Calculation of the limit includes volume from lands that may be deemed not suitable for timber production after further analysis during the planning process. The calculation of the SYL is not limited by land management plan desired condition, other plan components, or the planning unit's fiscal capability and organizational capacity. The SYL is not a target but is a limitation on harvest, except when the plan allows for a departure.

## T

**temporary roads** – Roads authorized by contract, permit, lease, other written authorization or emergency operation not intended to be part of the forest transportation system and not necessary for long-term management (36 CFR 212.1).

**thinning** – A cutting made to reduce stand density of trees primarily to improve growth, enhance forest health, or to recover potential mortality.

**threatened species** – Any species that the Secretary of the Interior or the Secretary of Commerce has determined is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. Threatened species are listed at 50 CFR sections 17.11, 17.12, and 223.102.

**timber harvest** – The removal of trees for wood fiber use and other multiple-use purposes (36 CFR 219.19).

**timber production** – The purposeful growing, tending, harvesting, and regeneration of regulated crops of trees to be cut into logs, bolts, or other round sections for industrial or consumer use (36 CFR 219.19).

**timber stand improvement** – A term comprising all intermediate cuttings made to improve the composition, constitution, condition, and increment of a timber stand.

**timber supply** – The amount of wood raw material available to be harvested within specified parameters of time and geographic area.

**tribal consultation** – A formal government-to-government process that enables Indian Tribes and Alaska Native Corporations to provide meaningful timely input and, as appropriate, exchange views, information, and recommendations on Forest Service proposed policies or actions that may affect their rights or interests prior to a decision. Consultation is a unique form of communication characterized by trust and respect. (See FSM 1509.05)

**two-aged system** – A planned sequence of treatments designed to regenerate or maintain a timber stand with two age classes. A two-aged system is a form of even-aged management.

## U

**unauthorized trail** – A trail that is not a forest trail or a temporary trail and that is not included in a forest transportation atlas (36 CFR 212.1).

**understory** – The trees and other vegetation growing under a more or less continuous cover of branches and foliage formed collectively by the upper portion (overstory) of adjacent trees and other woody growth.

**uneven-aged stand** – A stand of trees of three or more distinct age classes, either intimately mixed or in groups.

**uneven-aged system** – A planned sequence of treatments designed to regenerate or maintain a timber stand with three or more age classes. Treatments include single-tree selection, and group selection regeneration methods.

**urban** – An area characterized by a substantially urbanized environment. The background may have natural-appearing elements.

**utilization standards** – Utilization standards are specifications for merchantable forest products offered in a timber sale.

## V

**values, market** – Prices of market goods and services measured in real dollars in terms of what people are willing to pay as evidenced by market transactions.

**values, non-market** – Prices of non-market goods and services imputed from other economic values.

**vegetation management** – An activity that changes the composition, structure, or other characteristics of vegetation to meet specific objectives. A variety of vegetation treatments or silvicultural prescriptions may be used, with the most common methods being timber harvest (may be regeneration, intermediate, or salvage harvests), precommercial thinning (i.e., in sapling stands), fuel reduction treatments (may be commercial or noncommercial products), prescribed fire, or tree or shrub planting.

**viable population** – A population of a species that continues to persist over the long term with sufficient distribution to be resilient and adaptable to stressors and likely future environments. (36 CFR 219.19)

**viewshed** – The total landscape seen, or potentially seen from all or a logical part of a travel

route, use area, or water body.

**visual resource** – The composite of basic terrain, geological features, water features, vegetative patterns, and land-use effects that typify a land unit and influence the visual appeal the unit may have for visitors.

## W

**water yield** – The measured output of the forest’s streams expressed in acre-feet. The amount or volume of water that flows in a given period of time from a watershed.

**waterbars** – A change in the grade of a roadbed, trail surface, or fire line used to divert water off the surface to prevent it from eroding ruts and possibly carrying sediment to a stream.

**watershed** – A region or land area drained by a single stream, river, or drainage network; a drainage basin. (36 CFR 219.19)

**watershed condition** – The state of a watershed based on physical and biogeochemical characteristics and processes. (36 CFR 219.19)

**wetlands** – Those areas that are inundated by surface or ground water with a frequency sufficient to support and that, under normal circumstances, do or would support a prevalence of vegetation or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction. Wetlands generally include swamps, marshes, bogs, and similar areas such as sloughs, potholes, wet meadows, river overflows, mud flats, and natural ponds.

**wild and scenic river** – A river designated by Congress as part of the National Wild and Scenic Rivers System that was established in the Wild and Scenic Rivers Act of 1968 (16 U.S.C. 1271 (note), 1271–1287). (36 CFR 219.19) for possessing outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural or other similar values.

**wilderness** – Any area of land designated by Congress as part of the National Wilderness Preservation System that was established in the Wilderness Act of 1964 (16 U.S.C. 1131–1136). (36 CFR 219.19)

**wilderness study area** – One of the areas selected by the Chief of the Forest Service from an inventory of undeveloped National Forest System lands as having apparent high qualities for wilderness. Lands possessing the basic characteristics of wilderness and designated by Congress for further wilderness study. A study can determine whether they should be recommended for addition to the National Wilderness Preservation System.

**wildfire** – An unplanned, unwanted wildland fire including unauthorized human-caused



fires, escaped wildland fire use events, escaped prescribed fire projects, and all other wildland fires where the objective is to put the fire out.

**wildland fire** – Any non-structure fire that occurs in vegetation or natural fuels. Wildland fire includes prescribed fire and wildfire.

**wildland urban interface (WUI)** – The line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels. Describes an area within or adjacent to private and public property where mitigation actions can prevent damage or loss from wildfire.

**wildlife** – All non-domesticated mammals, birds, reptiles, and amphibians living in a natural environment, including game species and non-game species. Animals, or their progeny (i.e., feral animals - including horses, burros, and hogs), that once were domesticated, but escaped captivity, are not considered wildlife.

**woodlands** – A forested condition with an open tree canopy; tree crowns not usually touching (generally forming 25 to 60 percent cover).

**woody biomass** –includes logging slash, limbs, tops, and small diameter trees that would typically be noncommercial.

## **X**

**xeric** – Pertaining to sites or habitats characterized by decidedly dry conditions.

## **Y**

**yarding** – A term used to describe operations used to move logs from stump to point where logs are loaded for transport to mill. Most commonly used in cable logging operations.