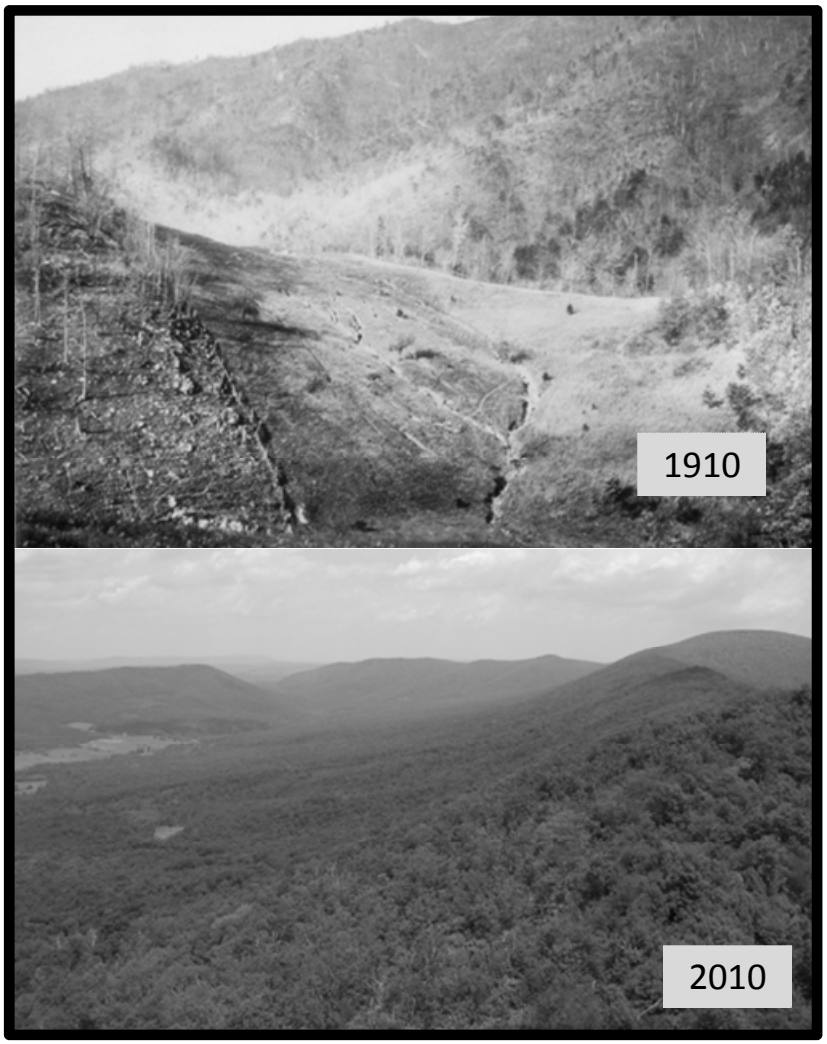
U.S. Department of Agriculture
Forest Service
Southern Region

Revised Land and Resource Management Plan

George Washington National Forest



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June 2013

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CHAPTER 1 - INTRODUCTION

PURPOSE OF THE LAND MANAGEMENT PLAN

The Revised Land and Resource Management Plan for the George Washington National Forest (hereafter referred to as the Forest Plan or Plan) provides for the ecological, social and economic sustainability of the natural resources on lands administered by the George Washington National Forest (GWNF). Desired conditions, land use allocations, suitable management practices, objectives, standards, and monitoring and evaluation requirements are the statements of the Plan's management direction for the next 10 to 15 years. The Plan is the implementing guide for fulfilling the mission of the Forest Service: "to sustain the health, diversity, and productivity of the nation's forests and grasslands to meet the needs of present and future generations."

The Forest Plan is strategic in nature. Future projects will follow direction contained in this plan but actual activities accomplished will be determined by annual budgets and site-specific project analyses and decisions. Subsequent environmental analysis will be based on direction in the Council on Environmental Quality *Regulations for Implementing The Procedural Provisions of The National Environmental Policy Act* (40 CFR Parts 1500-1508) and the *Environmental Policy and Procedures Handbook* (FSH 1909.15). In addition to direction in this plan, projects will also be guided by Forest Service manuals, handbooks, and other directives.

The Forest Plan is adaptive, in that new knowledge and information can be analyzed and the Plan changed, if appropriate, at any time. Changes to management direction in the Forest Plan are made by a formal amendment process, with public notification and involvement opportunities.

This Forest Plan implements Alternative I as outlined in the accompanying Final Environmental Impact Statement (FEIS). The Plan and FEIS have been prepared in accordance with the Code of Federal Regulations at 36 CFR 219 (1982 planning regulations, as allowed under the 2012 Planning Rule), the National Forest Management Act of 1976 (NFMA) and the National Environmental Policy Act (NEPA) of 1969.

According to 36 CFR 219.1(a), Forest Plans "shall provide for multiple use and sustained yield of goods and services from the National Forest System in a way that maximizes long-term net public benefits in an environmentally sound manner." More specifically, the key decisions made in this Forest Plan for the George Washington National Forest are:

- Forest multiple-use goals and objectives that include a description of the desired conditions of the forest and an identification of the quantities of goods and services that are expected to be produced or provided [36 CFR 219.11(b)]. These are identified as forestwide desired conditions in Chapter 2 and as objectives in Chapter 3.

- Establishment of multiple-use prescriptions for each management area, including proposed and probable management practices [36 CFR 219.11(c)]. All lands managed by the George Washington NF are allocated to one of 29 management prescription areas that reflect different desired conditions and suitable uses, or allowable activities. Management direction for these areas is in Chapter 4.

- Establishment of management requirements, including associated standards and guidelines that would apply to implementation of the Forest Plan [36 CFR 219.11(c), 219.13 to 219.27]. These are identified as forestwide standards and management prescription area standards in Chapter 4.

- Descriptions of lands suitable or not suitable for specific resource activities, including timber production [(16 USC 1604(k); 36 CFR 219.14)]. These are described as suitable uses in Chapter 3 and as standards in Chapter 4.

- Establishment of the allowable sale quantity (ASQ) of timber to ensure a sustained yield of wood products in perpetuity [16 USC 1611 and 36 CFR 219.16]. The ASQ is identified as an objective in Chapter 3.

- Identification of lands as preliminary administrative recommendations for inclusion in the National Wilderness Preservation System [36 CFR 219.17; FSH 1909.12, Chapter 73.11]. These areas are allocated to Management Prescription Area 1B - Recommended Wilderness Study Areas in Chapter 4.

- Identification of Research Natural Areas (RNAs), which are examples of important forest, shrubland, grassland, alpine, aquatic, and geologic types that have special or unique characteristics of scientific interest and importance and that are needed to complete the national network of RNAs [36 CFR 219.25]. The Forest has two existing RNAs and is not identifying the need for any additional areas.

- Identification of river segments that are suitable for inclusion in the National Wild and Scenic Rivers System [PL 90-542; 36 CFR 219.2(a)]. These segments are allocated to Management Area Prescriptions 2C2 - Eligible Wild and Scenic Rivers-Scenic and 2C3 – Eligible Wild and Scenic Rivers-Recreational in Chapter 4.

- The monitoring and evaluation requirements needed to ensure that Forest Plan direction is carried out and to determine how well outputs and effects were predicted [36 CFR 219.11(d)]. These requirements are in Chapter 5.

A separate decision incorporated into this document is the determination of the national forest system lands in the GWNF that are administratively available for oil and gas leasing and the associated stipulations. The leasing availability decision, as described in the Record of Decision, makes National Forest System lands unavailable for federal oil and gas leasing. This decision does not affect existing oil and gas leases or privately owned oil and gas rights. Since this is a separate decision, new information could develop resulting in a new availability decision before the plan goes through another full revision. Therefore, this plan establishes a framework to guide any future availability decisions by including direction on the suitability of areas for leasing under various conditions and standards to direct drilling activities.

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)]. If a proposed project or activity is not consistent with the Forest Plan, the Responsible Official has the following options:

- modify the proposal so that the project or activity is consistent;
- reject the proposal; or
- amend the Forest Plan contemporaneously with the approval of the project or activity so that the project or activity is consistent with the Forest Plan, as amended. The amendment may be applicable only to the project or activity [36 CFR 219.10(f)].

PLAN STRUCTURE

The Forest Plan is organized into several major parts: Chapter 1-Introduction; Chapter 2-Vision; Chapter 3-Strategy; Chapter 4-Design Criteria; Chapter 5-Implementation and Monitoring; and Appendices, including a Glossary.

Chapter 1 – Introduction. This chapter contains an introduction, the purpose and format of the Forest Plan, the context of the George Washington National Forest on local, regional and national levels and brief summaries of the Analysis of the Management Situation and significant issues.

Chapter 2 - Vision. This chapter describes the social, economic and ecological attributes (desired conditions) we would like to see in the future. Forestwide desired conditions apply across the entire forest's landscape, such as conditions for water quality or ecological systems.

Chapter 3 - Strategy. This chapter describes how we will move toward our desired conditions. Objectives describe specific outcomes that can measure progress toward achieving or maintaining desired conditions. Objectives may be accomplished by maintaining the desired condition or by implementing a project or activity designed to restore or achieve the desired condition. Objectives are linked to the Forest Monitoring Plan. Suitable uses are summarized from the standards and other plan direction into a table that describes some of the primary management activities that are compatible with desired conditions. This chapter also includes management approaches, which are strategies likely to be used for achieving desired conditions and objectives. Management approaches incorporate priorities, program emphases, budget trends, past program accomplishments, and partnership opportunities. The management approach is not a required, binding section of the plan but it provides a framework to describe the measures expected to be used within our current and expected levels of funding, staffing and partnership opportunities.

Chapter 4 - Design Criteria. This chapter describes the standards (design criteria) that guide our management activities. While desired conditions and objectives define where we are headed with management of the George Washington National Forest, standards define the rules we will follow in getting there. Standards are specific technical resource management directions and often preclude or impose limitations on management activities or resource uses, generally for environmental protection, public safety, or resolution of an issue. These design criteria are either forestwide or specific to a management prescription area. This section also references other existing guidance outside this Plan found in public laws, regulations, Forest Service manuals, and handbooks. Other existing guidance is generally not repeated in this Plan. These forestwide design criteria are then followed by desired conditions and design criteria that vary by management prescription area.

Chapter 5 - Implementation and Monitoring. This chapter provides guidance for putting the Forest Plan into practice, or implementation. Monitoring and evaluation provide information to determine whether programs and projects are meeting Forest Plan direction, and whether the Plan should be amended or revised. This chapter also establishes monitoring questions that are to be answered over the course of Forest Plan implementation.

Appendix A - Definition of Riparian Corridor

Appendix B - Old Growth Strategy

Appendix C - Timber Analysis – Suitability, Sale Program, and Silvicultural Systems

Appendix D - Priority Watersheds

Appendix E - Summary of the Analysis of the Management Situation

Appendix F - Glossary

Appendix G - Research Needs

Appendix H - Monitoring Tasks

Appendix I - Maps of Areas with Additional Timber Harvest and Road Construction Limitations

Appendix J – Biological Opinion Incidental Take Statement

Management Prescription Area Map - The map accompanying this Forest Plan displays the boundaries and allocations of the management prescription areas. This map was generated using a Geographic Information System accurate to a scale of ¾ inch to one mile. The boundaries displayed on this map can be assumed to vary on the ground up to 500 feet in any direction.

RELATIONSHIP OF THE FOREST PLAN TO OTHER DOCUMENTS

The Forest Plan is the key document in a set of documents that integrates and displays information relevant to management of GWNF. Other documents that will form the administrative record for the Plan include the Environmental Impact Statement (EIS), the Record of Decision (ROD), Analysis of the Management Situation (AMS) report, public participation documentation and social, biological and economic analyses. Together these documents demonstrate comprehensive analyses, public involvement, and decision-making processes.

George Washington National Forest Environmental Impact Statement (EIS)
This Forest Plan represents the selected alternative, Alternative I, for managing the land and resources of the George Washington National Forest as described in the accompanying EIS. Documentation of the Forest Plan's environmental impacts is contained in the EIS, which is a result of thorough analysis and considerations using currently available science. The planning process, analysis procedures, and other alternatives considered in developing the Forest Plan are also described or referenced in the EIS. The Forest Plan provides general, program-level direction for projects and activities on the five ranger districts of the Forest. Activities and projects will be implemented to carry out the direction of the Plan. These site-specific projects will be tiered to the accompanying EIS as provided for in 40 CFR 1502.20.

Revised Land and Resource Management Plan for the Jefferson National Forest
The George Washington National Forest and the Jefferson National Forest are two distinctively proclaimed administrative units that operate under two Forest Plans. However, the day-to-day management of the two forests was placed under one Forest Supervisor in 1995. The Forest Plan for the Jefferson was completed in 2004 in conjunction with several other Southern Appalachian Forests, following completion of the Southern Appalachian Assessment. This Plan for the GWNF has been designed to be compatible to the Jefferson's Plan, where feasible, to facilitate management of the combined forests.

USDA Forest Service Strategic Plan
The USDA Forest Service Strategic Plan FY 2007-2012 established strategic goals and outcomes to guide the Forest Service in delivering its mission. These goals and outcomes include:

Goal 1. Restore, Sustain, and Enhance the Nation's Forests and Grasslands
Outcome: Forests and grasslands with the capacity to maintain their health, productivity, diversity, and resistance to unnaturally severe disturbance.

Goal 2. Provide and Sustain Benefits to the American People
Outcome: Forests and grasslands with sufficient long-term multiple socioeconomic benefits to meet the needs of society.

Goal 3. Conserve Open Space
Outcome: Forests and grasslands with sufficient long-term multiple socioeconomic benefits to meet the needs of society.

Goal 4. Sustain and Enhance Outdoor Recreation Opportunities
Outcome: A variety of high-quality outdoor recreational opportunities on the Nation's forests and grasslands are available to the public.

Goal 5. Maintain Basic Management Capabilities of the Forest Service
Outcome: Administrative facilities, information systems, and landownership management with the capacity to support a wide range of natural resource challenges.

Goal 6. Engage Urban America with Forest Service Programs
Outcome: Broader access by Americans to the long-term environmental, social, economic, and other types of benefits provided by the Forest Service.

Goal 7. Provide Science-Based Applications and Tools for Sustainable Natural Resource Management

Outcome: Management decisions are informed by the best available science-based knowledge and tools.

Federally Listed Threatened and Endangered Mussel and Fish Conservation Plan

The George Washington and Jefferson National Forests worked closely with the U.S. Fish and Wildlife Service in 2004 to develop the Federally Listed Threatened and Endangered Mussel and Fish Conservation Plan for both forests. The conservation plan included the life history, threats, conservation needs and specific conservation measures for federally listed mussel and fish species that have potential to be affected by forest activities. This Forest Plan incorporates all of the specific conservation measures identified in the Federally Listed Threatened and Endangered Mussel and Fish Conservation Plan.

PREVIOUS FOREST PLANS

The *Coordinated Use and Resource Management Plan* covered management of the George Washington NF for the period of 1957 to 1967 and established the following use priorities to govern forest management: 1) water; 2) wildlife; 3) recreation; 4) timber; and 5) other uses. The order of the priorities was based on the largest number of users and importance to the overall welfare of the public. The plan established zones to protect roadsides, the Blue Ridge Parkway and the Appalachian Trail from visual impacts, identified natural areas at Laurel Fork on the Warm Springs Ranger District and Ramseys Draft on the current North River Ranger District, established streamside management zones 100 feet from streambanks, recreation zones near major developments, non-commercial harvest zones on unproductive areas, and transportation plans to assure that roads would be multipurpose. The plan established that protection of soil and water was mandatory in all activities and provided for special damage prevention treatments in the municipal watersheds of Staunton, Harrisonburg, Lynchburg, Clifton Forge, Strasburg, Woodstock, Buena Vista and other watersheds.

In 1972 the Forest prepared the *Direction for Managing the George Washington National Forest* as part of the Chief's Framework for the Future and the Regional Forester's Guide for Managing the National Forests in the Appalachians. This plan established objectives to:

1. Protect and perpetuate the GWNF by: a) preventing loss or deterioration of valuable forest products and productive resources; b) protecting and perpetuating unique flora, fauna, and geologic features; and c) correcting existing damage or pollution.

2. Develop and use the GWNF by: a) controlling public access and use; b) acquiring lands as authorized; c) providing a variety of game and non-game fish and wildlife; d) providing recreation facilities and opportunities; e) providing a permanent road and trail network, designed to insure limited public access; f) producing sawtimber and veneer products on the best sites and pulpwood on poorer sites; g) providing development space for major community projects; and h) permitting oil, gas, and mineral harvest.

3. Provide special social services by: a) enforcing laws and providing for public safety; b) keeping the public and their representatives informed and involved in Forest activities; c) helping local schools teach natural resource conservation; and d) training and employing disadvantaged persons.

The 1972 plan noted that the Forest could not produce "all things for all people at all times." Products or service objectives were prioritized as follows: 1) insure water, air, and soil purity; b) create a recreation environment; c) create a learning environment, d) produce timber products; e) produce minerals; f) provide public development space; and g) produce forage products.

The Forest prepared the first Land and Resource Management Plan under the Resource Planning Act and National Forest Management Act in 1986. This plan focused on the following issues: 1) minimizing the loss of unique or special areas including research natural areas, wilderness, roadless areas and special interest

areas; 2) responding to increases in recreation demand, both dispersed and developed; 3) fish and wildlife habitat management; 4) transportation access needs; 5) land ownership adjustment and boundary management ; 6) management of soil and water resources; 7) meeting energy needs; 8) law enforcement; and 9) timber management.

The Land and Resource Management Plan was revised in 1993. The 1993 Forest Plan provided a variety of resource benefits, including wood, wildlife, fish, range, dispersed recreation, developed recreation, minerals, wilderness and special uses, in a manner that maintained the diversity, productivity and long-term sustainability of ecosystems. Conservation of biodiversity was an integral part of sustaining multiple uses of the Forest. The major issues addressed included: 1) maintaining biodiversity (including the issues of fragmentation of habitat, management of old growth vegetation, management of riparian areas, unique natural communities, threatened and endangered species); 2) timber management; 3) road and trail access; 4) management of roadless areas and special management areas; 5) visual resources; 6) vegetation management; 7) minerals management; 8) management of the gypsy moth; and 9) providing for the best mix of goods and services.

THE GEORGE WASHINGTON NATIONAL FOREST'S NICHE

George Washington National Forest ownership totals over 1 million acres, with approximately 960,000 acres in Virginia and 106,000 acres in West Virginia. Of the gross 1.8 million acres within the Forest's proclamation boundaries, approximately 59% is National Forest System land. The Forest is divided into five ranger districts located in thirteen counties in Virginia and four counties in West Virginia (Figures 1 and 2).

In 1911, the Weeks Act provided the authorization for purchase of lands in States where enabling legislation was passed. Less than a month after the passage of the Weeks Law, purchases on the headwaters of the Potomac, along Massanutten Mountain, and in the Natural Bridge area were approved. Most of the largest purchases were from land companies. Subsequent additions brought the George Washington (originally called the Shenandoah) National Forest to its present size. The George Washington National Forest has played, and continues to play, some distinct roles within a regional or national context. The George Washington National Forest:

- Contains the headwaters of the Potomac and James Rivers and contributes to the drinking water supplies of at least 30 communities including Washington, DC and Richmond, VA.

- Is the largest federal landowner in the Chesapeake Bay watershed.

- Provides a diversity of recreation opportunities to local rural residents, nearby communities and towns, and to the highly urban areas of the mid-Atlantic. Facilities offer opportunities that range from highly developed campgrounds, swimming beaches and picnic shelters to minimally developed overnight and day use areas that serve primarily as access points to trails, creeks, rivers, lakes and general forest areas. Approximately 10.5 million people live within counties that are 75 miles from the Forest border.

- Contains some of the most extensive remote backcountry recreation opportunities east of the Mississippi River.

- Provides tremendous opportunities for frontcountry and backcountry hiking, horseback riding, and mountain biking on trails jointly maintained by the Forest Service and many partners.

- Provides motorized recreation for all-terrain vehicles on 60 miles of designated motorized trails and for off-highway vehicles on nearly 250 miles of high clearance roads. Contains a vast system of federal, state, county and Forest Service roads used for driving for pleasure.

- Contains the scenic backdrops to the Shenandoah Valley and many local communities. Provides access to outstanding scenic vistas across the Forest.

- The region surrounding the Forest is a mix of ownerships, ranging from the Monongahela National Forest on the west, the Jefferson National Forest on the south, the Shenandoah National Park (USDI National Park Service) on the east, a number of state parks and forests, and an extensive intermingling of private lands (over 3,000 miles of boundary). This highlights the unique niche that the GWNF fills in connecting biological habitat and resources for ecological and species diversity and in providing social and economic opportunities for a large and growing population base.

- Contains nationally significant areas designated by Congress, including six Wildernesses, Mount Pleasant National Scenic Area and the Appalachian National Scenic Trail.

- Contains one of the largest blocks of forested lands under federal management in the eastern U.S. where habitat for a wide diversity of species needing closed, open or interspersed habitat can be managed to meet long-term habitat objectives.

- Comprises approximately 5.5% of the 19.2 million acre timber products market area with a total standing volume of about 0.5 bcf (billion cubic feet) and growth estimated at 0.03 bcf per year. This resource provides a portion of the estimated demand of 0.3 bcf per year created by 217 sawmills, three paper/pulp mills, and three engineered wood product manufacturers in the area.

- Provides an important component for biological diversity in the landscape of the eastern U.S.

- Contains most of the known occurrences of the Cow Knob, Shenandoah Mountain and Big Levels salamanders in the world.

- Contains Laurel Fork, a unique area in the state of Virginia that has given rise to a forest of northern hardwoods and red spruce, unlike the Appalachian oak forest that dominates the rest of the George Washington National Forest. This area contains one of the finest examples of northern boreal natural community complexes in Virginia and is the only representative of the Alleghany Plateau Ecoregion within the Commonwealth.

- Had the first Memorandum of Understanding (MOU) with any state agency in the nation on management of fish and wildlife, when it signed an MOU with the Virginia Department of Game and Inland Fisheries in 1938. This partnership plus a similar one established with West Virginia Division of Natural Resources have resulted in a long-term commitment to cooperative management of the wildlife and fisheries resources on the Forest.

- Provides access to public lands for hunting and fishing in areas enhanced by cooperative management between the Forest Service and the Virginia Department of Game and Inland Fisheries and the West Virginia Division of Natural Resources.

- Surrounds the Shenandoah Valley, which holds much of this nation's history. Native Americans lived and hunted this valley for several thousand years. Thomas Fairfax, George Washington, Stonewall Jackson and Robert E. Lee all walked through this land. The George Washington National Forest contains land that was part of the "Breadbasket of the Confederacy" and housed numerous iron furnaces where cannon balls were made for the southern armies.

- Provides opportunities for nature-based education to a wide variety of local and area residents.

- Was the location of the first Civilian Conservation Corps (CCC) camp in the nation, at Camp Roosevelt NF-1 in Edith Gap, Virginia. The CCC program was one of the most successful of President Franklin Delano Roosevelt's (FDR) New Deal Programs during the Great Depression. The men employed under the CCC program at this camp and subsequent camps across the Forest and across the nation, built and maintained numerous roads, trails and facilities still enjoyed by forest visitors today.

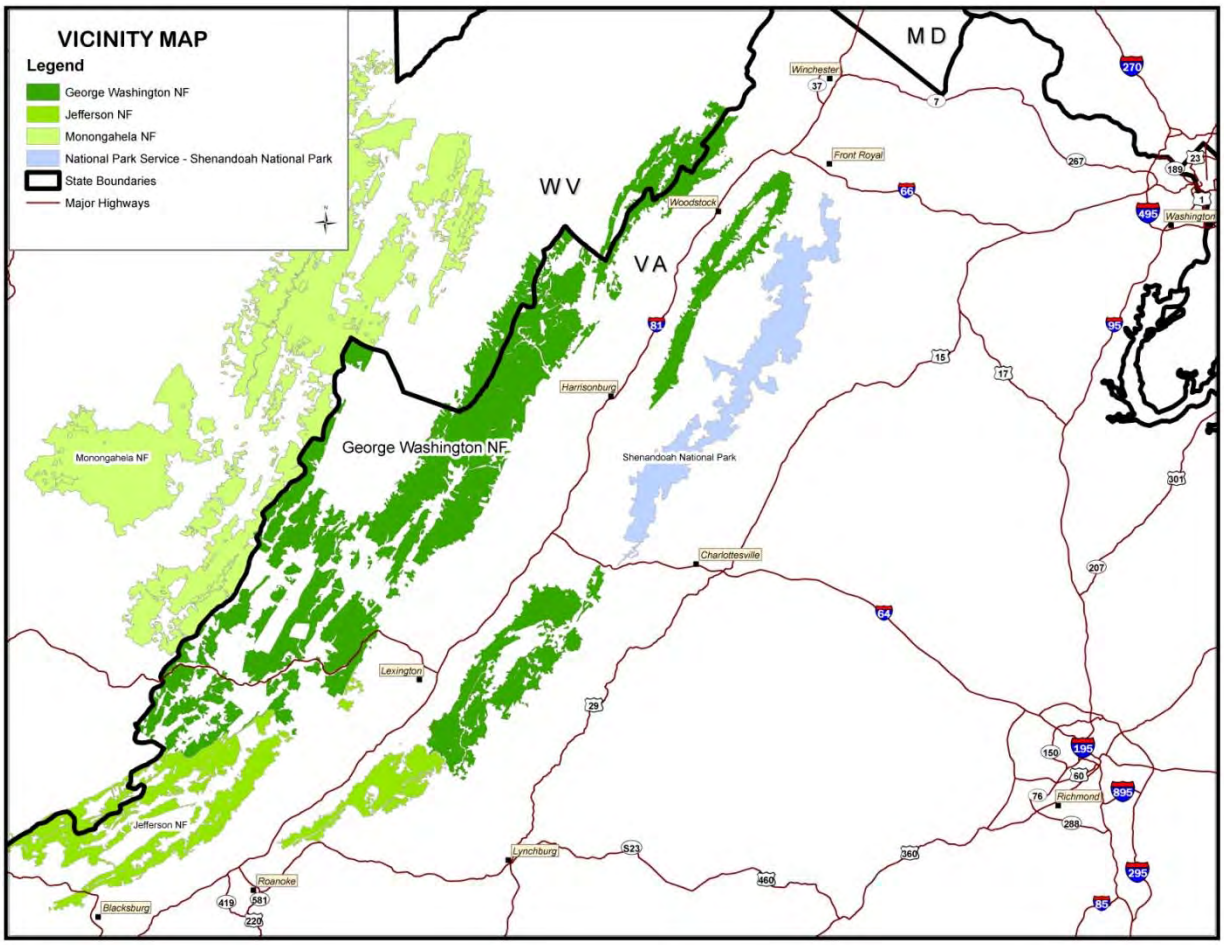

Figure 1-1. Vicinity Map of the George Washington National Forest

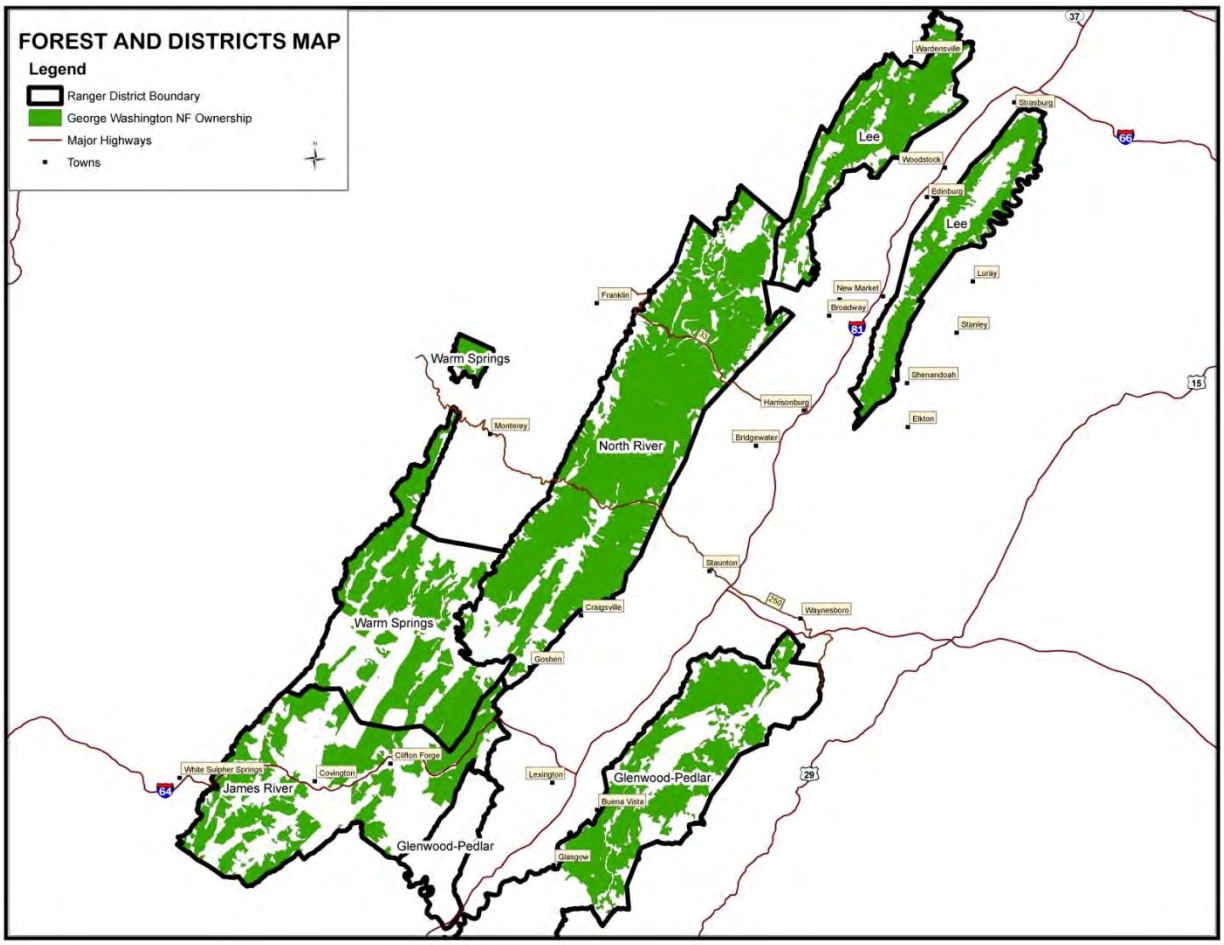

Figure 1-2. Ranger Districts of the George Washington National Forest

PUBLIC INVOLVEMENT AND COLLABORATION

Public collaboration is a key part of the planning process. Our goals for public collaboration associated with this planning process were: to ensure that all individuals and groups interested in or affected by the management of the George Washington National Forest have the opportunity to be informed and participate in the revision process; to reach an informed understanding of the varying interests; and to consider these interests in developing this revised plan.

Public issues, management concerns, and resource use and development opportunities were used to identify what direction management of the forest should take in the future, including what goods and services would be provided and what the environmental conditions should be. Many opportunities were provided for people to get involved in the planning process and to provide comments. Issues submitted by the public, as well as from within the Forest Service, guided the need to change current management strategies. Significant issues are described in Appendix E.

The first public scoping period for revision began in 2007, under the 2004 planning regulations. The Notice of Intent for the plan revision process for the George Washington National Forest was provided in the Federal Register on February 15, 2007 under the planning procedures contained in the 2005 Forest Service planning rule. One series of public workshops at seven locations was held. On March 30, 2007, the federal district court

for the Northern District of California enjoined the Forest Service from implementing the 2005 planning rule and the revision was suspended. The Forest Service adopted a new planning rule and notification of adjustment for resuming the land management plan revision process was provided in the Federal Register on June 24, 2008. A series of five topical public workshops were held between July 2008 and February 2009. On June 30, 2009, the 2008 planning rule was enjoined by the United States District Court for the Northern District of California and the revision of the GWNF Forest Plan was again suspended. On March 10, 2010 a Notice of Intent to prepare an environmental impact statement and revised land management plan using the provisions of the 1982 National Forest System land and resource management planning regulations for the George Washington National Forest was published in the Federal Register. A series of public workshops were held at six locations during the scoping period. Two additional workshops were held in July and October of 2010 to discuss alternative development.

In June 2011 the Draft Environmental Impact Statement and Draft Revised Forest Plan were released for public review and comment. Comments were accepted from the issuance of the Notice of Availability until October 17, 2011. Public workshops were held in June and July during this comment period at the following locations: Fairfax County Government Center, Fairfax, VA; Woodstock National Guard Armory, Woodstock, VA; Rockbridge County High School, Lexington, VA; East Hardy High School, Baker, WV; Augusta County Government Center, Verona, VA; and Valley Elementary School, Hot Springs, VA.

CHAPTER 2 – VISION

DESIRED CONDITIONS OVERVIEW

The USDA Forest Service Strategic Plan (FY 2007-2012) defines the mission of the Forest Service "to sustain the health, diversity, and productivity of the Nation's forest and grasslands to meet the needs of present and future generations."

Desired conditions describe the vision for achieving the Forest Service's mission on the George Washington National Forest. They portray the ecological, social and economic conditions the Forest is expected to provide in the future when the management direction in the Forest Plan has been successfully implemented. Desired conditions "paint a picture" of an area by describing the appearance and condition of various natural and social resources within the area, in part giving a sense of the type and extent of human influence that a forest visitor could expect. They were developed through an integration of input from the public comments we have received, national and regional Forest Service goals, changes and trends affecting the George Washington National Forest, and sound science for various resources and uses of the forest.

Just like ecosystems, many desired conditions are interrelated across resource areas and are not mutually exclusive. A recurring theme that runs throughout the desired conditions for the George Washington NF is the focus on sustaining the diverse terrestrial, aquatic and vegetative communities unique to the central and southern Appalachians through the foundation of healthy watersheds, productive soils, and healthy airsheds. This in turn will allow the Forest to continue to provide a large holding of public land that can offer many different social and economic contributions for current and future generations.

In some cases, our desired condition matches the current condition, so our goal is to maintain what we have. In other cases, we need to work toward meeting the desired conditions and success in achieving them can only be measured over the long-term.

The Forest may need to make adjustments in the desired conditions if monitoring results indicate they are not achievable in the long-term or if there is an imbalance in what the Forest is accomplishing. Budget levels are an important factor in moving toward the desired conditions. Desired conditions are aspirations; they are not final decisions or commitments to action.

This chapter identifies desired conditions that apply across the entire GWNF. Desired conditions that apply to certain management prescription areas (land allocations) are identified in Chapter 4.

FORESTWIDE DESIRED CONDITIONS

WATERSHEDS - WATER, SOIL, AIR, AND GEOLOGY

WATERSHED RESOURCES

Background

The lands known today as the George Washington National Forest could hardly have been called a "forest" when it was officially designated in 1918. Clearing of steep mountain land for farming and grazing, iron ore mining, widespread and indiscriminate logging, and uncontrolled and intense wildfires in leftover logging debris, had led to severe erosion and increased flooding. As a result, by the early 1900s, much of the higher elevation mountains and ridges in southwestern Virginia had been transformed into stumps and brushfields (The Lands Nobody Wanted, Conservation Foundation Report, 1977). In 1911, Congress authorized and directed the Secretary of Agriculture *"to examine, locate, and purchase such forested, cut-over, or denuded lands within the watersheds of navigable streams as in his judgment may be necessary to the regulation of the flow of navigable streams or for the production of timber."* In 1918, as a result of this Act, the George

Washington National Forest (known at that time as the Shenandoah National Forest) was established from these "lands nobody wanted."

The Forest Plan continues the tradition of watershed restoration, protection and stewardship begun on this national forest over 90 years ago. Maintenance and restoration of healthy, diverse, and resilient watersheds is a high priority in our management activities. Standards to protect water quality do not vary across the Forest.

The George Washington National Forest is located in two major river drainages, the James and Potomac, both of which drain into the Chesapeake Bay.

Priority watersheds highlight those watersheds with sensitive aquatic species, currently identified water quality concerns due to private land or natural causes (impaired streams), and public water supplies. These watersheds (listed in Appendix D) will be a priority for inventorying soil and water improvement needs, restoring streams and streamside systems to fully functioning systems, restoring habitat for sensitive aquatic and riparian species, addressing opportunities to reduce impacts from roads through relocation or decommissioning, and evaluating any new proposals for special uses that could affect water quality.

Relatively undisturbed watersheds, or reference watersheds, help define systems with a high level of integrity. Five watersheds (Table 2-1) have been identified as reference watersheds on the Forest. The streams within these watersheds have existing water quality conditions considered to be representative of the ecological sub-section under relatively undisturbed, natural situations.

Table 2-1. Reference Watersheds

Reference Watershed	Location	Acres
Lost Run	Laurel Fork Special Biological Area	592
Morgan Run	Southern Massanutten	817
Ramseys Draft	Ramseys Draft Wilderness	6,298
North Fork Simpson Creek	Rich Hole Wilderness	1,900
Little Cove Creek	Mt. Pleasant National Scenic Area and Appalachian Trail Corridor	867

Desired Conditions for Watersheds

DC WTR-01: Watersheds within the Forest are resilient, have intact hydrologic function, and support the quality and quantity of water necessary for channel maintenance, aquatic habitats, riparian habitats and beneficial water uses, including public water supplies. Watersheds are not contributing sediment to streams at levels which adversely impact downstream uses, riparian ecosystems and aquatic lifecycles. Beavers provide a variety of beneficial watershed functions where their presence does not conflict with other desired conditions.

DC WTR-02: The identified reference watersheds remain in a relatively undisturbed condition, with a low level of human intervention or impact. These areas retain a natural, forested appearance shaped primarily by natural processes. Uneven-aged forest communities with intermediate to high shade tolerance dominate the area. Landscapes feature a structurally diverse older aged forest community with a continuous forested canopy, with the exception of gaps created by storms, insects, diseases, and/or fire. Insects and diseases play a role in shaping future species composition and successional stages across these areas. Streams within reference watersheds have water quality conditions considered to be representative of the ecological sub-section under relatively undisturbed, natural situations.

DC WTR-03: Channeled ephemeral streams maintain their hydrologic function and the areas adjacent to these streams retain their ability to filter sediment from upslope disturbances while achieving the goals of the adjacent area.

NOTE: Desired Conditions related to riparian areas are stated under Management Prescription Area 11–Riparian Corridors in Chapter 4.

DRINKING WATER

Background

Water has been a key factor in National Forest Management since the creation of the National Forests. 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 – the riparian areas. Riparian areas are managed with direction that can be found related to Management Prescription Area 11–Riparian Corridors in Chapter 4. The Forest is required to provide water quality that is sufficient to support all aquatic stream life. Many species are sensitive to water quality and a number are endangered and threatened species. Therefore, the Forest Plan has established standards that protect water quality for these species, as well as providing high quality drinking water sources.

The following is a list of water systems that rely on the GWNF for drinking water supplies.

Table 2-2. Drinking Water Supplies Within or Downstream of the Forest

Water System Name	River System
Buffalo River	Amherst, Town of
Coles Run Reservoir	South River Sanitary District - ACSA
Dry River - Riven Rock	Harrisonburg, City of
Jackson River	Covington, City of
James River	Henrico County Water System
James River	James River Correctional Center
James River	Richmond, City of
James River - Abert	Lynchburg, City of
James River - College Hill	Lynchburg, City of
Main Stem Potomac River	Berkeley County PWSD - Potomac River
Main Stem Potomac River	Brunswick, City of
Main Stem Potomac River	Frederick County
Main Stem Potomac River	Hagerstown, City of
Main Stem Potomac River	Harpers Ferry Water Works
Main Stem Potomac River	Paw Paw Water Works
Main Stem Potomac River	Rockville, City of
Main Stem Potomac River	Sharpsburg/Williamsport/Washington County
Main Stem Potomac River	Shepherdstown Water
Main Stem Potomac River	Washington Aqueduct (Army Corps of Engineers)
Main Stem Potomac River	Washington Suburban Sanitary Commission, Laurel
Maury River	Maury Service Authority

Water System Name	River System
North Fork Shenandoah River	Broadway, Town of
North Fork Shenandoah River	Food Processors Water Cooperative, Inc
North Fork Shenandoah River	Strasburg, Town of
North Fork Shenandoah River	Winchester, City of
North Fork Shenandoah River	Woodstock, Town of
North River	Bridgewater, Town of
North River	Harrisonburg, City of
North River Dam	Staunton, City of
Pedlar Reservoir	Lynchburg, City of
Potomac River	Fairfax County Water Authority
Potomac River	Leesburg, Town of
Shenandoah River	Berryville, Town of
Shenandoah River	Charles Town Water Dept
Smith Creek	Clifton Forge, Town of
South Branch Potomac River	Romney Water Dept
South Branch Potomac River and South Fork of the South Branch Potomac River	Moorefield Municipal Water
South Fork of the South Branch Potomac River	Navy Information Operations Command/MB
South Fork Shenandoah River	Front Royal, Town of

While most of these water sources are from rivers whose watersheds contain areas of private and federal lands, several reservoirs are located on rivers whose watersheds are predominantly National Forest System lands. These are:

- Coles Run Reservoir
- Switzer Lake (located seven miles upstream from Harrisonburg's intake)
- Clifton Forge Reservoir
- Staunton Reservoir
- Lynchburg Reservoir

The following public water supplies on the GWNF are designated by the Commonwealth of Virginia-Department of Environmental Quality as Public Water Supplies:

Public Water Supply	Description
Coles Run	Coles Run and Mills Creek from South River Sanitary Districts raw water intake to its headwaters
Dry River and Skidmore Fork	Dry River from Harrisonburg's raw water intake (11.7 miles above its confluence with North River) to a point 5 miles upstream, unless otherwise designated
Jackson River	Jackson River and its tributaries from Covington's raw water intake to points 5 miles upstream
NF Shenandoah-Cedar Creek	North Fork Shenandoah R and its tributaries from the Winchester raw water intake to points 5 miles upstream (to include Cedar Creek and its tributaries to their headwaters)

Public Water Supply	Description
North Fork Shenandoah	North Fork Shenandoah River and its tributaries from Strasburg's raw water intake to points 5 miles upstream
North Fork Shenandoah	North Fork Shenandoah River and its tributaries from Woodstock's intake (1/4 mile upstream of Rt 609 bridge near Woodstock) to points 5 miles upstream
North River	North River from Staunton Dam to its headwaters
Pedlar River	Pedlar River and its tributaries from Lynchburg's raw water intake (near Lynchburg Reservoir) to points 5 miles upstream
Smith Creek	Smith Creek and Clifton Forge Reservoir from Clifton Forge's raw water intake to their headwaters

Desired Conditions for Drinking Water

DC DRW-01: Abundant clean water is produced within the Forest in response to the increasing downstream public need for drinking water, as many communities in Virginia, West Virginia and the District of Columbia rely on the high quality water from the George Washington National Forest for their drinking water.

DC DRW-02: Forest management activities are focused on protecting drinking water sources while achieving the other ecological, social and economic goals of the Forest Plan. Practices to prevent contamination of drinking water sources are applied and monitored.

DC DRW-03: Significant potential sources of drinking water contamination are identified and the susceptibility of the water supply to contamination from these sources is determined. Existing roads, trails, developed and dispersed recreation sites, and areas of concentrated recreation use are examined and problems mitigated. Old mining, grazing, and agricultural areas are stabilized and rehabilitated where necessary.

DC DRW-04: Dams to store municipal drinking water are frequently found immediately downstream from the Forest on State or private lands. Expansion of these reservoirs to provide additional drinking water needs may be necessary in the future. Water-based recreation and associated facilities may be developed and maintained when these reservoirs are on or adjacent to national forest land and such development is acceptable to the municipality.

DC DRW-05: Vegetation management activities are designed to maintain and restore habitat for a variety of native species in conditions that are resistant to large-scale disturbances that could affect drinking water. These large-scale disturbances include wildfires, landslides, and insect and disease epidemics (including but not limited to hemlock woolly adelgid, gypsy moth, southern pine beetle, and oak decline).

SOIL RESOURCES

Background

Soils on the Forest have mainly formed in two geographical provinces, the Blue Ridge and the Appalachian Valley and Ridge.

The northern part of the Glenwood-Pedlar Ranger District is located in the Blue Ridge Province and contains soils developed from metamorphic and igneous rock such as quartzite, phyllite, and greenstone. Soils developed from these parent bedrocks are moderately deep (20 inches to 40 inches to bedrock) to deep (greater than 40 inches to bedrock). These soils have moderate-to-severe erosion potential and moderate-to-high productivity levels. The southern slopes of soils derived from quartzite bedrock are low in productivity.

The other four ranger districts are located in the Appalachian Valley and Ridge Province and contain soils that developed from sedimentary rock such as shale and sandstone. A small portion of the Warm Springs District in

Highland County is located in the transitional zone of the Allegheny Plateau physiographic province. The Laurel Fork area is in this transition zone. Soils have developed from sedimentary rock are moderately deep to shallow, less than 20 inches to bedrock. These soils have a slight-to-moderate erosion potential due to the common occurrence of greater than 35 percent rock fragments. North and west slopes are moderately productive. Southeast and southwest slopes are moderate-to-low in productivity.

Many lower slope positions in the Appalachian Valley and Ridge Province contain a fragipan (restrictive layer) two to three feet beneath the surface. The fragipan restricts the downward movement of water and the growth of roots and can cause a perched water table that produces very wet surface conditions during periods of high precipitation.

Some of the geology and soils of the Forest have a low buffering capacity against the effects of acid deposition, which has been occurring on the Forest for decades. These low buffered areas have the greatest risk of becoming increasingly acidic, having greater amounts of aluminum in rooting zones and having stressed ecosystems due to losses of beneficial plant-available soil nutrients.

Desired Conditions for Soils

DC SOL-01: Forest soils have adequate physical, biological, and chemical properties to maintain or improve vegetative growth, hydrologic function, nutrient cycling and slope stability. Minimal erosion and sedimentation occur due to the successful use of best management practices and erosion control during forest management activities.

DC SOL-02: Generally, soils dedicated to growing vegetation have a normal soil profile that is typical for undisturbed soils on similar landforms in the local area. This soil profile includes an organic layer of partly to highly decomposed organic litter and humus. This layer is underlain by a layer of mineral soil, which is uncompacted, darker in color, and higher in available plant nutrients than the soil layers below it. Soil compaction does not prevent vegetation from growing. Soils dedicated to growing vegetation, which have been altered by past disturbance, are recovering toward a pre-disturbance condition with vegetative cover. Areas dedicated for other uses, such as campgrounds and system roads and trails, are not contributing above normal amounts of sediment to stream channels. Soil productivity is sustained through nitrogen and carbon fixation, mineral release from weathering parent material, decaying organic matter, and translocation of nutrients.

DC SOL-03: Forests and streams located in areas of nutrient poor bedrock and soils are not being negatively affected by our management decisions.

AIR RESOURCES

Background

There are no Class I airsheds on the George Washington National Forest; however, Class I areas near the Forest include the James River Face Wilderness in the Jefferson National Forest and the Shenandoah National Park.

The Forest is located downwind of two major areas of coal-fired power generation, the Ohio River Valley and the Tennessee Valley Authority. It is located within a day's drive of a large percentage of the United States' population and numerous major cities, including Washington DC and Richmond, Virginia. The heavily traveled Interstate Highway 81 runs through the length of the Forest. Nitrogen oxide, sulfur dioxide and fine particulates are the main pollutants emitted from these sources that are affecting resources within the Forest.

Air quality in western Virginia is currently meeting all National Ambient Air Quality Standards (NAAQS) established by the Environmental Protection Agency. On the GWNF, prescribed burning is the management activity most likely to contribute to air pollution, and current burning levels are not contributing to exceedence

of air quality standards. However, prescribed burning levels associated with returning the national forests to more historic fire conditions will require an increase in forestwide prescribed burn acreages from recent years. This increase was anticipated and the Forest worked with Virginia Department of Environmental Quality (VDEQ) and other state air agencies to incorporate these increases into the emissions inventory used by VDEQ for Regional Haze and Ozone State Implementation Plans. Air modeling analyses out to the year 2018 show that even with the anticipated increase in prescribed fire emissions on the Forest, the State should be able to attain the NAAQS and show reasonable progress in visibility improvement.

Although the NAAQS are not exceeded, Forest resources are affected by air pollution, especially sulfur dioxide. Air pollution that originates outside the Forest boundary is transported onto the Forest and contributes to acid deposition and regional haze. In both cases sulfate particles from sulfur dioxide emissions are the primary pollutants of concern. Fine sulfate particles contribute to visibility impairment and stream water acidification. Forest soils can also be affected where high sulfur deposition and sensitive soils/geology coincide. Sulfur deposition has declined over the past 20 years, and this is expected to continue as new pollution control programs are implemented by State and Federal governments. But affected streams do not recover immediately because stored sulfur is slowly released from the soil into the water and acidification continues.

Forests and streams located in areas of base-poor bedrock (sandstone and granite) and with elevations above 3,000 feet are being negatively affected by historic and current levels of acid deposition. This is especially true for spruce-fir forests. The two primary acidifying compounds are sulfates and nitrates. Of those two compounds, nitrate deposition is most important in spruce-fir forests. The sources of acidifying compounds are generally located off National Forest System lands, with coal-fired electric generation facilities and vehicles accounting for the bulk of sulfur and nitrogen emissions. When nitrogen is deposited in excess of forest nutrient needs, some nitrate will leave the soil and take with it essential nutrients. When nutrients are leached from soils, growth of vegetation can be reduced. Sulfur deposition can cause the same effects on soils when the capacity to absorb sulfur is exceeded. Sulfur and nitrogen compounds in the soil also cause acidification of high elevation streams, thereby endangering the habitat of native brook trout and other aquatic species. Recent and projected trends in air pollutants show sulfur compound emissions decreasing over the life of the Plan, whereas nitrogen compound emissions are projected to remain relatively flat.

Ozone pollution is negatively affecting the health of sensitive forest tree species, black cherry for example. Ozone is formed through chemical reactions in the atmosphere between nitrogen oxide (from vehicles and coal-fired power generation) and volatile organic compounds (from industrial and natural sources) in the presence of sunlight. Ozone levels are highest during the summer. Recent studies suggest that competitiveness between tree species is changing over time due to elevated ozone levels. Tree species that are not sensitive to ozone will out-compete more sensitive species over time. Significant reductions in ozone pollution over the life of the Plan are not anticipated because nitrogen oxide emissions are not expected to decrease significantly.

Desired Conditions for Air Quality

DC AIR-01: Visitors to the Forest experience clean air and clear vistas, with recognition that the Forest is affected by human-caused regional haze originating predominantly from pollution sources outside the Forest boundaries.

DC AIR-02: Activities on NFS lands meet the National Ambient Air Quality Standards designed to protect human health. Forest resources are free of air pollution impacts.

DC AIR-03: Sulfur and nitrogen deposition decline to levels not harmful to forest resources.

DC AIR-04: Smoke impacts on the general public and adjacent landowners from prescribed fires are minimal and short-term.

GEOLOGIC RESOURCES

Background

Geologic resources include: groundwater; caves, sinkholes, disappearing streams and other karst features; evidence of climate change, such as Ice Age features; fossils and paleontological resources; volcanic features; unusual landforms; waterfalls; and interesting rocks and minerals. Groundwater-dependent ecosystems are areas where communities of plants, animals, and other organisms depend on access to, or discharge of, groundwater.

Geologic materials and geologic processes control or influence a host of ecological factors, such as slope aspect, slope steepness, the areal extent of landforms and associated vegetation, the distribution and composition of soil parent material, the structure and composition of vegetation, the physical character of wetlands, riparian area and stream substrates, the quantity and quality of stream water and groundwater, and some natural disturbance regimes. The diversity of surface geology (bedrock and surface materials; structures, landforms, and dynamic processes acting on the earth's surface) is the foundation for most of the Forest's diversity of ecosystems.

Surface geologic processes are a part of the natural disturbance regime in the Forest. These processes include: the erosion, transport and deposition of sediment; mass wasting or landsliding; flooding; changes in stream channels; groundwater flow; and the formation of caves, sinkholes and other karst features.

Geologic hazards are geologic processes that may threaten public safety and damage infrastructure such as roads and campgrounds. Geologic hazards include flooding, sinkholes, ground collapse, piping, abandoned mines, groundwater pollution, and a wide range of landslides such as rock falls, rockslides, debris slides, debris flows, slumps, and stream bank failures. Geologic hazards can affect people, infrastructure, and natural resources on and off the Forest.

Desired Conditions for Geologic Resources

DC GEO-01: Geologic resources are identified and managed for educational, interpretative, scientific, scenic, paleontological, ecological, recreational, public use, historic, and/or archaeological values.

DC GEO-02: Groundwater is protected. Management activities, especially in karst areas, are not adversely affecting groundwater. Groundwater-dependent ecosystems (such as springs, bogs, fens, seeps, and cave streams) are protected and sustained.

DC GEO-03: Geologic hazards and potential threats to public safety, campgrounds, roads, bridges, trails, dams and other facilities are identified and managed. Ground-disturbing management activities are not causing or contributing to geologic hazards.

DC GEO-04: Karst areas are identified and recognized as a geologic-based ecosystem vulnerable to groundwater contamination due to interaction between the surface and subsurface. Caves, sinkholes and other karst features function to maintain groundwater quality and provide habitat for species that depend on these features.

DC GEO-05: Management activities are appropriate to the diverse geologic processes, structures, and materials.

ECOLOGICAL SYSTEMS DIVERSITY

Background

Ecosystem diversity is defined as the variety and relative extent of ecological systems including their species composition, structure (the successional stages and canopy conditions of that system across a landscape) and associated processes. Ecological systems are recurring groups of biological and vegetative communities that are found in similar physical environments and are influenced by similar dynamic ecological processes, geological substrates, and/or environmental gradients. These systems have similar potential and opportunities for management. Vegetation, wildlife, soils, water, geology, climate, fire and other natural disturbances all contribute to ecosystem diversity. By restoring and maintaining the key characteristics, conditions, and functionality of the native ecosystems found on the GWNF to the extent possible, the Forest should be able to sustain ecosystem diversity and also provide for the needs of the diverse plant and animal species on the forest (species diversity). Ecological sustainability in turn supports social and economic sustainability. Ecological systems provide opportunities for nature watching, hunting, fishing, wildflower viewing, and other recreational activities, and support local communities through sustainable forest products.

In the abiotic component of ecosystems, geological diversity is the foundation for terrestrial and aquatic ecosystems. The diversity of both bedrock and surficial geology (below ground and surface materials, including structures, landforms, and dynamic processes acting on the earth's surface), combined with moisture regimes, determine the distribution and variety of the individual ecological systems on the landscape (Anderson and Ferree 2010). The Ridge and Valley section is composed of long belts of parallel, strike ridges and valleys trending in a northeast-southwest direction. A strike ridge is a linear, asymmetric ridge formed by the differential erosion of inclined sedimentary bedrock layers. One flank of the strike ridge is a steep slope cutting across several bedrock layers (antidip or scarp slope). In contrast, the other side of the ridge is a less steep slope conforming to the slope of the underlying bedrock layer (dip-slope). Pine, pine-oak, and drier oak types are found on the south to west facing slopes with dry to mesic oak on the north to east facing slopes. This pattern repeats itself along most of the ridges of the Ridge and Valley. The ridges consist of sandstone, shale, and siltstone with the occasional bands of limestone. Red spruce and northern hardwoods are found at the highest elevations along mountain crests and cool, moist northern slopes. The valleys are composed of shale and carbonate bedrock (limestone and dolomite), creating distinctly different “poor valleys” (less fertile) and “rich valleys” (more fertile). Shale barrens are found in the driest, least fertile aspects while cove forests occur in the more fertile, moist concave landforms. It is in the carbonate valleys where karst terrain with numerous sinkholes and caves are often found, plus the occasional alkaline glade. The Ridge and Valley has a trellis drainage pattern. The strike ridge has two distinct drainage systems. The antidip slope has many, closely-spaced, steep, deeply-incised hollows; the dip-slope has fewer, widely-spaced, less steep and less incised drainages.

The Blue Ridge section is the mountain range on the easternmost part of the Forest dominated by granitic bedrock with metamorphosed sedimentary rocks on the lower slopes of the western flank. Lenses of basalt volcanic rocks intrude into and add to diversity in the granitic terrain. In contrast to the linear bands of alternating bedrock layers in the Ridge and Valley, the massive granitic bedrock of the Blue Ridge forms a broad landscape of more homogeneous bedrock and random landforms. The occurrences and composition of ecological systems in the Blue Ridge are similar to the Ridge and Valley but the pattern tends to be more random. Red spruce is not found in this portion of the Blue Ridge, but mafic glades and woodlands occur here and not in the Ridge and Valley. The quantity and quality of surface water and groundwater has less variation in the widespread granitic landscapes, which have a radial and dendritic drainage pattern.

Ecological Systems

The framework for classifying terrestrial ecological systems on the GWNF was defined using NatureServe’s International Ecological Classification Standards (NatureServe 2004a, 2004b) and cross-walked with the Virginia Department of Conservation and Recreation–Division of Natural Heritage Vegetation Community types and Forest Service FSVeg forest types (see Ecosystem Diversity Report, FEIS Appendix E). Twenty-four terrestrial ecological systems were identified for the GWNF that represent both major and rare community

types and several aquatic systems. The Ecosystem Diversity Report describes the 24 ecological systems in more detail, including the composition, principal characteristics, and potential threats for each ecosystem. Since many of the ecological systems have similar key attributes, indicators, species associates and plan components, the twenty-four ecological systems were combined into nine systems for the analysis documented in Ecosystem Diversity Report and are shown in Table 2-3. The framework for diversity of aquatic ecological systems is described in the Aquatic Ecological Sustainability Analysis Report (FEIS Appendix G).

Table 2-3. Ecological Systems and System Groups

Ecological System	Ecological System Group
Central and Southern Appalachian Spruce-Fir Forest	Spruce Forests (approximately 600 acres)
Appalachian (Hemlock)-Northern Hardwood Forest	Northern Hardwood Forests (approximately 13,000 acres)
Southern Appalachian Northern Hardwood Forest	
Southern and Central Appalachian Cove Forest	Cove Forests (approximately 61,000 acres)
Northeastern Interior Dry-Mesic Oak Forest	Oak Forests and Woodlands (approximately 756,000 acres)
Central and Southern Appalachian Montane Oak Forest	
Central Appalachian Dry Oak-Pine Forest	
Southern Appalachian Oak Forest	
Southern Ridge and Valley/Cumberland Dry Calcareous Forest	
Southern Appalachian Montane Pine Forest and Woodland	Pine Forests and Woodlands (approximately 162,000 acres)
Central Appalachian Pine-Oak Rocky Woodland	
Southern Appalachian Low-Elevation Pine Forest	
Southern and Central Appalachian Mafic Glade and Barrens*	Alkaline and Mafic Glades and Barrens (approximately 4,000 acres)
Central Appalachian Alkaline Glade and Woodland*	
North-Central Appalachian Circumneutral Cliff and Talus*	Cliff, Talus and Shale Barrens (approximately 14,000 acres)
North-Central Appalachian Acidic Cliff and Talus*	
Appalachian Shale Barrens*	
Central Appalachian River Floodplain	Floodplains, Wetlands and Riparian Areas (approximately 51,000 acres)
Central Appalachian Stream and Riparian	
Central Interior Highlands and Appalachian Sinkhole and Depression Pond*	

Southern and Central Appalachian Bog and Fen*	
North-Central Appalachian Acidic Swamp*	
North-Central Appalachian Seepage Fen*	
Caves and Karstlands	Caves and Karstlands (approximately 119,000 acres)

* The systems with asterisks are considered rare or naturally small in scale

Spruce Forests Ecological System Group

Found only in the higher elevations near border of Ridge & Valley and Alleghany Plateau (roughly the Virginia - West Virginia state line) this system is a predominately mature or old-growth forest with a diversity of vertical and age structure on sites to which this species is appropriate and of historical occurrence. Overstories are typically dominated by red spruce, but this system grades into northern hardwoods. Often other tree species found with red spruce include American beech, yellow birch, and sugar maple. The herbaceous layer is typically dominated by mosses, ferns, sedges, and forbs, The Spruce Forest system supports populations of rare species associated with boreal habitats to the north and endemic species associated with this habitat in the mid-Appalachians, such as the Virginia northern flying squirrel.

Northern Hardwood Forests Ecological System Group

Usually found in the highest elevations on the Forest this system is dominated by overstories that include American beech, sugar maple and yellow birch with some eastern hemlock. Midstories and understories are usually well developed. The understory varies quite a bit, in some places dominated by evergreen shrubs and in others by herbs.

Cove Forests Ecological System Group

This closed-canopy forest is found on concave landforms and is often associated with riparian areas. Overstories are typically dominated by yellow poplar, hemlock, birch, magnolia, basswood, and red maple. Midstories are well developed and fairly diverse. In acidic coves, rhododendron is often abundant. Understories have a well-developed herb layer, often very dense and usually high in species richness, in all but the acid coves. Well-developed and fairly diverse subcanopy and shrub layers are often also present in all but the acid coves. This system supports populations of associated rare species, such as ginseng.

Oak Forests and Woodlands Ecological System Group

This is the most common ecological system on the Forest and can be viewed as the primary forest in which all other vegetation types occur. Oak forests range from those found on moist (or mesic) sites to dry sites that then grade into yellow pine. Overstory trees on mesic sites are typically dominated by red oak, white oak and hickory with chestnut oak, black oak and scarlet oak on drier sites. Heath shrubs such as blueberry, huckleberry and mountain laurel are common in the understory, especially on drier sites and often form a dense shrub layer along with grasses and sedges. Fewer heath shrubs are found on mesic sites and the understory often consists of various perennial herbaceous plants.

Pine Forests and Woodlands Ecological System Group

Next to Oak Forest and Woodlands this ecological system is the most common on the Forest and occupies the upper slopes and south to west exposures. Overstories are typically dominated by table mountain pine, pitch pine, and some Virginia pine along with dry site oaks such as chestnut oak, scarlet oak, and bear oak. A dense heath shrub layer is almost always present. Mountain laurel is most typical and dominant, but species of blueberry and huckleberry along with fetterbush may also be dominant. Native grasses and sedges are common along with dry site herbs and forbs. Their density varies depending on shrub cover.

Cliffs, Talus, and Shale Barrens Ecological System Group

Vegetation on and near shale barrens is mostly classified as woodland, but may include large open areas of sparse vegetation. Dominant trees are primarily chestnut oak, pitch pine, table mountain pine, and Virginia pine; although on higher-pH substrates the common trees include eastern red cedar and white ash. Shale barren endemic plants are diagnostic in the herb layer. The substrate includes areas of solid rock as well as unstable areas of shale scree, usually steeply sloped.

The Cliff and Talus system comprises sparsely vegetated to partially wooded cliffs and talus slopes. It consists of vertical or near-vertical cliffs and the talus slopes below. In some cases, this system may take the form of upper-slope boulderfields without adjacent cliffs, where talus forms from freeze/thaw action cracking the bedrock. Most of the substrate is dry and exposed, but areas of seepage are often present. The vegetation is patchy and often sparse, punctuated with patches of small trees that may form woodlands in places.

Alkaline Glades and Woodlands and Mafic Glades and Barrens Ecological System Group

Alkaline Glades and Woodlands and Mafic Glades and Barrens support a patchy mosaic of open woodland and grassy herbaceous vegetation sometimes with a predominant woody short-shrub community present. The canopy species are species tolerant of dry, shallow soils, most commonly chestnut oak, pines and eastern red cedar. Shrubs may be dense, with species determined by soil chemistry and often include redbud and fragrant sumac. The herb layer is usually fairly dense and dominated by grasses, both in treeless areas and beneath open canopy. The forbs include species characteristic of other rock outcrops and grassland species, with a smaller number of forest species present.

The Alkaline system consists of woodlands and open glades on thin soils over limestone, dolostone or similar calcareous rock. In some cases, the woodlands grade into closed-canopy forests. Eastern red cedar is often a common tree, and along with chinquapin oak is indicative of the limestone substrate. Warm season grasses such as big and little bluestem are often the dominant herbs; forb richness is often high. The mafic system found in the Blue Ridge consists of vegetation associated with shallow soils over predominantly mafic bedrock (which is rich in iron and magnesium), usually with significant areas of rock outcrops.

Floodplains, Wetlands and Riparian Areas Ecological System Group

Riparian Areas are functionally defined as areas with three-dimensional ecotones of interaction that include both terrestrial and aquatic ecosystems. They extend down into the groundwater, up above the canopy, outward across the floodplain, up the near-slopes that drain into the water, laterally into the terrestrial ecosystem, and along the watercourse at a variable width. The riparian corridor has distinctive suitable uses and standards so this ecological system is managed specifically through Management Prescription Area 11–Riparian Corridors.

Overstories are typically dominated by the same trees occupying the oak and cove forest types. Midstories and understories are often well developed and diverse. This system supports populations of many associated rare species.

Caves and Karstlands Ecological System Group

This important ecological system is found to a limited degree on the Forest where it is associated with carbonate bedrock (limestone and dolostone) and often characterized by internal drainage. This bedrock type is typically found in valleys where it is dissolved by groundwater creating surface depressions (sinkholes) and underground caves and tunnels.

Structural Diversity

Structural diversity involves both successional stage and canopy conditions that are important to all forested ecological systems. Structure is also important to non-forested systems. Every forested community requires a balance of structural classes representing a diversity of vertical structure that allows for recruitment of young growth to replace losses due to storm events, pest infestations, wildfires, and biological age. An appropriate balance of vertical structure within each community also provides habitat for associated terrestrial species that require either grass/forb-seedling/shrub (early seral), and/or trees (late seral) at some stage in their life cycle. These concepts are described in more detail in the Species Diversity section of this chapter.

Early successional forest is defined as regenerating forest of 0 to 35 years of age, depending upon the ecological system. It is characterized by woody growth of regenerating trees and shrubs, often with a significant grass/forb component, and relatively low density or absent overstory. This condition is distinguished from permanent grass/shrubland habitats by having relatively dense woody vegetation, as opposed to grasses and forbs. Such conditions may be created by even-aged and two-aged regeneration cutting, and by natural disturbance events, such as windstorms, wildfire, and some insect or disease outbreaks.

Ages defining the remaining successional stages vary by ecological system group. Mid-successional forest often begins to develop with the sapling/pole forest characterized by canopy closure of dense tree regeneration, with tree diameters typically smaller than 10 inches diameter at breast height. It then proceeds through stratification of over-, mid-, and understory layers. Late successional forests, from 50 to 100 years in age and older, include old growth conditions. This stage contains the largest trees and often has well-developed crown and canopy layers and scattered openings caused by tree mortality.

Another important type of condition that combines elements of both early and mid – to late successional forest is open woodlands. Created and maintained largely by periodic fire disturbance regimes, open woodlands are characterized by an overstory of trees that are spaced far enough apart to allow sunlight to reach the forest floor. This structural condition allows the development of a grassy/shrubby/herbaceous/woody understory more typical of early successional forest and grassland/shrublands. Many species depend on the juxtaposition of both overstory mature and a well-developed grassy/shrubby/herbaceous understory for their life cycle needs. In this stage canopy openings range from individual or multiple tree gaps to widely spaced trees with open-grown crowns.

Permanent grass/forb and seedling/sapling/shrub habitats are important elements of early successional habitat. Permanent openings typically are maintained for wildlife habitat on an annual or semi-annual basis with the use of cultivation, mowing, or other vegetation management treatments. These openings may contain native grasses and forbs or may be planted to non-native agricultural species such as clover, orchard grass, wheat, or small grains. Old fields are maintained on a less frequent basis (5-10 year intervals), usually with burning and mowing) or are succeeding to forest. They are largely influenced by past cultural activities and may be dense sod or a rapidly changing field of annual and perennial herbs, grasses, woody shrubs and tree seedlings.

Table 2-4. Definitions of Structural Classes

Open	Land with less than 10 percent canopy cover in permanent or long-term open condition (grasslands, barrens, etc.; not timber harvest regeneration)
Early Successional or Regenerating Forest	Stands developing after a major disturbance or timber harvest, generally less than 11 years in age in the most common systems, but can be up to 35 years
Mid-Successional Open Canopy Forest	Stands beyond regeneration that stay in a relatively open canopy (canopy closure of 25-60%)
Mid-Successional Closed Canopy Forest	Stands beyond regeneration where the canopy closes (canopy closure of 61% or greater)
Late Successional Open Canopy Forest	Stands reaching older ages of mature trees (50-100 years or greater) and more lasting structural conditions with overall open canopy (canopy closure of 25-60%; typical of an area being thinned)
Late Successional Closed Canopy Forest	Stands reaching older ages of mature trees (50-100 years or greater) and more lasting structural conditions with a largely closed canopy (all layers) greater than 60%, includes natural canopy gaps

Desired Conditions for Ecological Systems Diversity

DC ESD-01: Native ecological systems occupy appropriate sites. Native ecosystems sustain strong, resilient populations of associated terrestrial and aquatic species.

DC ESD-02: There is a mix of closed canopy forest, intermittent canopy, and open canopy conditions. Forest and woodland ecological systems support a diversity of tree ages, from regeneration to old growth, providing a relatively stable mix of ecological conditions across the landscape over time. Openings occur in individual tree-sized gaps and larger. Vegetation structure within patches of regenerating forest and woodland is diverse due to the presence of snags and live overstory trees. These forested systems are dominated by hardwoods, pines, or combinations of both. Non-forested systems are primarily dominated by shrubs, forbs, and grasses. Snags, downed wood, stumps, and other organic matter occur in sufficient abundance to support native species.

DC ESD-03: Ecological systems are intact and as resilient as possible to absorb negative effects associated with various natural and human-caused stresses. Forest ecosystems are in their natural state with limited infestations of invasive species to the fullest extent possible. Structural and compositional diversity occurs throughout the forest.

DC ESD-04: Open areas (including permanent and semi-permanent grasslands, shrublands and old fields) occupy around 4% of the area. These areas are typically less than 100 acres in size, but could be up to 500 acres.

Spruce Forests

DC ESD-05: Regenerating forests (0-35 years old) comprise less than 18% of system acreage and is generally in small canopy gaps. Mature forests (66 years old or older) comprise approximately 57% of system acreage. Fire is rare in this system and the canopy is predominantly closed.

Desired Structural Conditions for Spruce Forests

Structure	Early	Mid-Successional Closed Canopy	Mid-Successional Open Canopy	Late Successional Closed Canopy
% of ecological system	18	14	11	57
Age	0-35	36-65	36-65	66+

Northern Hardwood Forests

DC ESD-06: Regenerating forests occupy around 10% of the area. Late successional forests make up around 72% of the area. Since these sites are predominantly at high elevation and are mesic, fire is not a major disturbance mechanism. Weather events such as high wind, ice, heavy wet snow, and the combinations of these account for most disturbances where open canopies exist in about 10% of the area.

Desired structural conditions are patterned after the Southern Appalachian Northern Hardwood Forest System since it has a greater emphasis on closed canopy conditions which are more like the situation on the GWNF.

Desired Structural Conditions for Northern Hardwood Forests

Structure	Early	Mid-Successional Closed Canopy	Late Successional Open Canopy	Late Successional Closed Canopy
% of ecological system	10	18	10	62
Age	0-20	21-74	75+	75+

Cove Forests

DC ESD-07: Regenerating forests (0-10 years old) comprise around 4% of system acreage. Late successional forests (100 years old or older) comprise around 57% of system acreage. Fire is not a major disturbance in this system and typically occurs during the driest of conditions when fire may back and creep into these areas from upper slopes. Open canopy conditions are present on only about 9% of the area due to treefall gaps usually the result of downburst wind events and senescence or mortality of single trees. On the GWNF this type is interspersed with the oak dominated systems in concave landforms. Cove Forests often occupy land along riparian areas and adjacent to upland areas in concave landforms at upper ends of watersheds.

Desired Structural Conditions for Cove Forests

Structure	Early	Mid-Successional Closed Canopy	Late Successional Open Canopy	Late Successional Closed Canopy
% of ecological system	4	39	9	48
Age	0-10	11-99	100+	100+

Oak Forests and Woodlands

DC ESD-08: Regenerating forests (0-15 years old) comprise around 12% of system acreage. Fire is a very important component of this system (with a return interval of about 5 to 15 years) and results in open canopy structure on about 65% of the area. In many of the woodland areas native grasses are common. The mid and late successional open canopy represents most of the system where frequent low intensity fire and other disturbances such as ice and wind maintains open canopy conditions. The late successional closed canopy condition occurs where fire is excluded due to topographic and moist fuel conditions resulting in more mesophytic species composition that then makes opportunities for fire even more uncommon.

Desired Structural Conditions for Oak Forest and Woodlands

Structure	Early	Mid-Successional Closed Canopy	Mid-Successional Open Canopy	Late Successional Open Canopy	Late Successional Closed Canopy
% of ecological system	12	7	10	57	14
Age	0-15	16-69	16-69	70+	70+

Pine Forests and Woodlands

DC ESD-09: Regenerating forests (0-15 years old) comprise about 13% of system acreage. Mid to late successional forests comprise approximately 87% of system acreage. Frequent fire occurring about every 3-9 years is a very important component of this system and results in open canopy structure on about 80% of the area.

Desired Structural Conditions for Pine Forests and Woodlands

Structure	Early	Mid-Successional Closed Canopy	Mid-Successional Open Canopy	Late Successional Open Canopy	Late Successional Closed Canopy
% of ecological system	13	3	25	54	5
Age	0-15	16-70	16-70	71+	71+

Alkaline Glades and Woodlands and Mafic Glades and Barrens

DC ESD-10: Edaphic (soil conditions) features largely control these areas, but the open nature of the glades, woodlands and barrens continue to be maintained through fire which is operating in its natural regime. Non-native invasive plants are not a significant influence on vegetation in these areas. Recreation use is managed so that it does not adversely affect the native vegetation. This system supports populations of associated rare species, including the marsh muhly, stiff goldenrod, drooping bluegrass, tall cinquefoil, and Rand's goldenrod.

Cliffs, Talus, and Shale Barrens

DC ESD-11: Edaphic (soil conditions) features largely control these areas, but the open nature of the talus and edges of shale barrens continue to be maintained through fire which is occurring in its natural regime. Non-native invasive plants are not a significant influence on vegetation in these areas. Deer browsing is not impacting native vegetation. Recreation use is managed so that it does not adversely affect the native vegetation. This system supports populations of associated rare species, including the shale barren rockcress,

Millboro leatherflower, shale-barren blazing star, shale-barren evening primrose, Appalachian grizzled skipper, bristly sarsaparilla, chestnut lipfern, mountain sandwort, and three-toothed cinquefoil.

Floodplains, Wetlands and Riparian Areas

DC ESD-12: Regenerating forests (0-10 years old) are uncommon, though small openings are present and are important for key species. Open wetlands and open beaver meadows and ponds provide much of the open habitat conditions. Late successional forest is common and makes up most of the canopy. Fire is rare.

Caves and Karstlands

DC ESD-13: Caves and karstlands are protected both from recreational damage and from polluted water, which, in turn, protects the species that depend on them.

SPECIES DIVERSITY

Background

Maintaining a diversity of habitats for all species on the GWNF, especially threatened or endangered species, and enhancing wildlife habitat are important desired conditions. A diversity of plant and animal species is part of our natural heritage and provides forest visitors the opportunity to recreate in natural settings, view and study nature, hunt and fish. Forest lands serve as refuges for threatened, endangered and rare species, offer large contiguous forested areas where animal species can successfully reproduce and rear their young, offer key rest and feeding areas for migratory bird species, and provide important linkages (travel corridors) between State, Federal and other blocks of forested land.

As part of a strategic plan for species diversity, the GWNF developed the Species Diversity Report (FEIS Appendix F) as a supplement to the Ecosystem Diversity Report, which describes how the ecological characteristics for ecosystems on the George Washington National Forest (GWNF) were identified and incorporated into the Plan. To assess species diversity, a comprehensive list of plant and animal species was compiled by combining species lists from a variety of sources. Federally threatened and endangered species (T&E), sensitive species, locally rare species and other species with management concerns (e.g., demand species) were identified and a total of 295 species were evaluated. Species were then linked to the terrestrial ecological systems. Where appropriate, species were grouped before linking them to systems. Many species needing differing habitat characteristics throughout their life cycle occurred in multiple groups. All species have at least some of their needs covered by ecosystem diversity, but some species required additional plan components based on their major limiting factors. These components are described in the Management Approach and Objectives section of Chapter 3 and in Standards in Chapter 4.

THREATENED AND ENDANGERED SPECIES

There are ten species listed by the Department of Interior, U.S. Fish and Wildlife Service (USFWS) as federally threatened or endangered that have been documented on or near the Forest. The USFWS is the agency responsible for listing T&E species on lands managed by the GWNF. Since the 1993 Plan, two birds (bald eagle & peregrine falcon) that occur on the Forest and were listed as endangered have been delisted by the Service. The Forest Service cooperates with USFWS efforts in conserving T&E species through protection and habitat management. The Forest Service conducts activities and programs to assist in the identification, conservation, and protection of threatened and endangered species and their habitats. Site-specific evaluations are conducted for any proposed activity that may take place within habitat for these species or near known populations. These ten species are further described in Table 2-5.

Table 2-5. Federally Threatened and Endangered Species

Taxa	Species	Status	Primary Ecosystem(s)
Mammal	Indiana Bat (*Myotis sodalis*)	Endangered	Caves and Karstlands
Mammal	Virginia Big-Eared Bat *(Corynorhinus townsendii virginianus)*	Endangered	Caves and Karstlands
Mammal	Virginia Northern Flying Squirrel *(Glaucomys sabrinus fuscus)*	Endangered	Spruce & Northern Hardwood Forests
Mussel	James Spinymussel (*Pleurobema collina*)	Endangered	Floodplains, Wetlands and Riparian Areas
Arthropod	Madison Cave Isopod *(Antrolana lira)*	Threatened	Caves and Karstlands
Vascular Plant	Shale Barren Rock Cress (*Arabis serotina*)	Endangered	Appalachian Shale Barrens
Vascular Plant	Smooth Cone Flower (*Echinacea laevigata*)	Endangered	Central Appalachian Alkaline Glade and Woodland
Vascular Plant	Virginia Sneezeweed (*Helenium virginicum*)	Threatened	Floodplains, Wetlands and Riparian Areas
Vascular Plant	Swamp Pink (*Helonius bullata*)	Threatened	Floodplains, Wetlands and Riparian Areas
Vascular Plant	Northeastern Bulrush (*Scirpus ancistrochaetus*)	Endangered	Floodplains, Wetlands and Riparian Areas

MANAGEMENT INDICATOR SPECIES

The 1982 planning regulations guiding implementation of the National Forest Management Act charge the Forest Service with managing national forests to provide for a diversity of plant and animal communities consistent with overall multiple-use objectives. One planning tool used to accomplish this requirement is the designation of Management Indicator Species (MIS). They and their habitat needs are used to set management objectives and minimum management requirements, to focus effects analysis, and to monitor effects of plan implementation. MIS have been chosen to represent: threatened and endangered species; species with special habitat needs; species commonly hunted, fished, or trapped (demand species); non-game species of special interest; and species that indicate effects to major biological communities.

Table 2-6. Management Indicator Species

Common Name	Category (s)	Reason for Selection
Cow Knob Salamander	T/E/S Indicator, Special Interest Species Indicator	Indicates effectiveness of management activities designed specifically to meet conservation objectives for this species
Pileated Woodpecker	Special Habitat Indicator	Indicates the effectiveness of management in maintaining desired condition relative to abundance of snags
Ovenbird	Special Habitat Indicator	Indicates the effectiveness of management in maintaining desired conditions relative to forest interior habitat within mature mesic deciduous forests
Chestnut-sided Warbler	Special Habitat Indicator	Indicates effectiveness of management in achieving desired conditions within high elevation early successional habitats
Acadian Flycatcher	Special Habitat Indicator	Indicates the effectiveness of management in achieving desired conditions within mature riparian habitats
Hooded Warbler	Biological Community Indicator	Indicates the effectiveness of management at providing dense understory and midstory structure within mature mesic deciduous forests
Scarlet Tanager	Biological Community Indicator	Indicates effectiveness of management at establishing desired conditions in drier mid- and late-successional oak and oak-pine forests
Pine Warbler	Biological Community Indicator	Indicates effectiveness of management at maintaining mature pine forests
Eastern Towhee	Biological Community Indicator	Indicates effectiveness of management in achieving desired conditions in early successional habitats
Wild Brook Trout	Biological Community Indicator, Demand Species Indicator	Indicates effects of acidification of stream systems, and the effectiveness of management in mitigating these effects and effectiveness of management in meeting public demand for this species
Eastern Wild Turkey	Demand Species Indicator	Trends in harvest levels and hunting demand will be used to indicate effectiveness of management in meeting public demand for this species
Black Bear	Demand Species Indicator	Trends in harvest levels and hunting demand will be used to indicate effectiveness of management in meeting public demand for this species
Deer	Demand Species Indicator	Trends in harvest levels and hunting demand will be used to indicate effectiveness of management in meeting public demand for this species
Beaver	Riparian Ecological System Indicator	Indicates wetland restoration

Desired Conditions for Species Diversity

DC SPD-01: Natural ecological communities exist in amounts, arrangements, and conditions capable of supporting native and desired non-native species within the planning area.

DC SPD-02: Natural disturbances, such as fire, wind, insects and diseases, ice storms, and floods, modify the landscape, providing habitat for disturbance dependent species.

DC SPD-03: Beaver activity creates wetland mosaics that contribute to community and species diversity and provide high quality wildlife viewing opportunities.

DC SPD-04: Diverse habitats exist that range from early successional forests to late successional forests, in both open and closed overstory conditions. These early, late, closed, and open conditions will provide habitat structure for a wide range of native plant and animal species. Diverse habitat is provided for known populations of threatened and endangered species, sensitive species and locally rare species on the Forest.

DC SPD-05: Habitat for threatened and endangered species is provided to aid in recovery or movement towards recovery. Risks and threats are reduced or eliminated, especially during critical life stages such as nesting or raising offspring. The potential for sensitive species to become listed as threatened or endangered is reduced.

DC SPD-06: Habitat is provided for species requiring a mosaic of forest types and structures for their life cycle needs, including black bear, ruffed grouse, wild turkey, and white-tailed deer. Larger areas of early successional habitat in the form of old fields, wildlife openings, pastoral areas, and regeneration areas provide habitat for species such as yellow-breasted chat, northern bobwhite, prairie warbler, white-eyed vireos, golden-winged warbler, and cotton-tailed rabbits. Habitat is also provided for species associated with areas of mid- to late-successional forests. In cove and mesic hardwood/pine forests with predominantly closed canopies, species needing large areas of mature trees with some level of overstory structural diversity (canopy gaps) are present, including cerulean warblers, worm-eating warblers, wood thrushes, hooded warblers, pileated woodpeckers, woodland salamanders, and eastern gray squirrels. In mature mesic and xeric pine/hardwood open woodlands with a mosaic of grass/forb/shrub understories, species needing large areas of both mature trees and an open structure are present, including golden-winged warblers, whip-poor-wills, scarlet tanagers, eastern wood pee-wees, northern flickers, Indiana bats and other tree and cave bats, fox squirrels, and timber rattlesnakes near rock outcrops. In addition, xeric pine/hardwood open woodlands provide habitat for post-breeding and migratory stop-over needs for birds species normally associated with forest interior habitat for breeding. Open oak woodlands near riparian areas and in valley bottoms provide habitat for species such as fox squirrels, woodcock, and wood turtles.

DC SPD-07: Diverse breeding, wintering, migration, staging and stop-over diverse habitats for migratory species are provided in ways that contribute to their long-term conservation.

DC SPD-08: Early successional habitat at higher elevations for high priority species like the golden-winged warbler and smooth green snake is present in the form of open woodlands, regenerating forests, and grasslands/shrublands. Patches of these habitats are clustered on the landscape to provide habitat for area-sensitive species.

DC SPD-09: Some roads are seasonally inaccessible to motorized public travel to protect physical and biological resources and wildlife habitat.

DC SPD-10: Snags, downed wood, stumps, and other organic matter occur in sufficient abundance to support native wildlife species.

DC SPD-11: A combination of both dense shrub and relatively open understories exist across the landscape. Areas of blueberries, huckleberries, mountain laurel, and rhododendron are present. Hollow trees suitable for cavities and dens plus standing dead trees are common throughout the area.

DC SPD-12: A blight-resistant American chestnut (*Castanea dentata*) is reestablished on the Forest as a dominant tree species.

DC SPD-13: Watersheds with known populations of wood turtles are managed to maintain or enhance the terrestrial summer foraging habitat, nesting habitat and overwintering habitat of wood turtles. Human interactions, such as motorized vehicle use and recreation, are managed to minimize impacts to wood turtles.

OLD GROWTH

Background

The current amount and distribution of old growth (measured as the age of dominant overstory trees) on the Forest has been most influenced by management activities that preceded federal ownership. Natural disturbances, such as strong winds, large accumulations of ice, native insects and disease, wildfire and landslides, also affect old growth forest conditions, but they are regarded as being within the natural range of variability for forest successional dynamics. No plant or animal species in the Appalachians are known to require old growth forest conditions exclusively (i.e. are "old growth obligates") for their survival or continued existence.

Old growth forests are distinguished by not only old-age trees but also the presence of related structural attributes within the forest stand, such as large dead and down snags and gap-phase dynamics. The age at which a stand develops old growth attributes varies according to forest type (determined by dominant tree species) and reflects climate, site conditions (bedrock geology, soil type, aspect, moisture regime, elevation), and disturbance regime. The definitive characteristics for the different old growth forest types are contained in the document, "*Guidance for Conserving and Restoring Old-Growth Forest Communities on National Forests in the Southern Region, Forestry Report R8-FR 62*" and "*Information about Old Growth for Selected Forest Type Groups in the Eastern United States, General Technical Report NC-197*." See also Appendix B - Old Growth Strategy for more information regarding old growth.

Desired Conditions for Old Growth

DC OLD-01: A well-distributed and representative network of large, medium, and small old growth patches is provided over time for biological and social benefits. These patches are expected to be embedded in a forest matrix dominated by mid and late successional forests. Old growth areas are generally interconnected by mature forests.

DC OLD-02: On about 70,000 acres of Wilderness and Recommended Wilderness Study Areas, natural processes will determine the type of vegetation and structure of the old growth community. These landscapes feature a structurally diverse older aged forest community with occasional gaps created by disturbance events such as storms, insects, diseases, landslides, or wildland fire. These areas provide old growth characteristics in large blocks of land and contribute habitat for late successional, mature forest terrestrial and avian species. On about 350,000 acres of the forest (managed for Remote Backcountry recreation, Special Biological Areas, Research Natural Areas, National Scenic Areas, and Shenandoah Mountain Crest) predominantly natural processes will determine the type of vegetation and structure of the old growth community, though these areas will provide some additional areas of open woodland habitat since fire regimes will be within their historical range. These areas provide old growth characteristics in large blocks of land and contribute habitat for late successional, mature forest terrestrial and avian species. On the remainder of the forest, old growth conditions will be well dispersed predominantly in medium and small patches.

FOREST HEALTH

Background

There are a number of forces that lead to forest disturbances. Some are a direct result of human activities, such as the introduction or spread of non-native organisms and continuous suppression of wildfires. Some are indirectly related to human activities, such as climate change. Still others result from such forces as extreme weather events. Disturbances may have positive impacts on various ecosystem components such as creation of canopy gaps for natural regeneration or input of woody material into the soil nutrient cycle or aquatic habitats. Yet the scale of some forest disturbances can be such that adverse impacts to some ecosystem components are significant. The social and economic benefits from salvaging dead and dying trees should be considered in addition to the benefits of leaving the trees as sources for soil nutrient recycling or large woody debris. Regardless of the cause of the disturbance, full consideration of both the beneficial and negative

impacts of the disturbance on the ecosystem and desired conditions for the area should be considered in determining a response, or lack of response, to a given disturbance event. As stated elsewhere in this document, the overarching principle will be to foster a resilient and healthy, primarily forested ecosystem that can absorb, or survive through, these disturbance events. The disturbances for discussion here include: insects, disease, non-native invasive plants, and non-native invasive aquatic species. Other aspects of forest health related to age, species diversity, and species composition are discussed in the desired conditions of Ecological Systems elsewhere in this chapter.

Integrated Pest Management (IPM) principles are used during site-specific analysis. IPM is a decision-making and action process, which includes biological, economic, and environmental evaluation of host-pest systems to manage pest populations. IPM strategies involve a comprehensive systems approach to silvicultural, wildlife, fuel treatment, recreation and corridor management practices that emphasizes prevention of pest problems.

Insect and disease organisms are a significant component of forest ecosystems. Native organisms contribute to many ecological processes of forests including nutrient cycling, plant succession, and forest dynamics. In most cases, these native organisms are recognized as an integral component of forest health. In a few instances, however, these organisms cause unacceptable resource damage or loss, and negatively affect ecological, economic, or social values. In these cases, the organisms causing the damage are referred to as pests. Significant native insect pests on the George Washington National Forest include the southern pine beetle and a variety of defoliators. Significant native disease problems include oak decline, shoe-string root rot, and a variety of other decay organisms affecting living trees. Often, problems from these pests are the result of other components of the ecosystem being outside the natural range of variability, such as the loss or lengthening of fire frequencies or the loss of predator organisms that keep these pests within acceptable population sizes.

Throughout the past 100 years, a variety of insects, diseases, and plant species have been introduced to the United States and spread into the GWNF. These non-native organisms often are considered pests because they have no natural enemies or other naturally controlling agent and their unchecked spread can significantly damage native ecosystems and forest communities. Large areas of uniformly aged forests are particularly vulnerable to both native and non-native forest pest epidemics. The chestnut blight has reduced the American chestnut from a dominant tree species on this forest to a minor understory shrub. Other significant non-native pests include the gypsy moth, the hemlock woolly adelgid, beech bark disease, butternut canker, dogwood anthracnose and didymo.

Non-native invasive plants are introduced species that can thrive in areas beyond their natural range. These plants are characteristically adaptable, aggressive, and have a high reproductive capacity. Their vigor combined with a lack of natural enemies often leads to population outbreaks. While not all non-native species are known to disrupt native ecosystems, of particular concern are those that are successful at invading and rapidly spreading through natural habitats. Numerous non-native invasive plants have been documented across the George Washington National Forest and many infested sites present an immediate threat to natural communities, rare species sites, and other sites of high public interest.

Desired Conditions for Native and Non-Native Invasive Species

DC NNI-01: A forest environment is provided where damage to natural resources from forest pests (any native or non-native invasive species including plants, animals, insects, and/or diseases) are minimized when such damage prevents the attainment of other natural resource objectives.

DC NNI-02: New introductions of invasive species are minimized.

DC NNI-03: New invasive species infestations are promptly detected and eliminated before establishment.

DC NNI-04: Existing infestations of targeted invasive species are eradicated, controlled or contained.

DC NNI-05: Ecosystems impacted by invasive species have been effectively restored or rehabilitated to desired conditions and to conditions that reduce vulnerability to invasion or reinvasion by invasive species.

DC NNI-06: Healthy native ecosystems, particularly those that support threatened, endangered and sensitive species, are maintained or restored such that non-native organisms do not adversely impact the function of ecosystem processes.

DC NNI-07: The integrity of rare natural communities is protected from native and non-native invasive plant species, such as ailanthus (tree of heaven), kudzu, multiflora rose, and autumn olive. Non-native invasive species are not a demonstrable threat to the integrity of other natural communities.

FIRE

Background

Fire has played a major role in shaping vegetation communities in the Appalachian Mountains. Of all the natural disturbances that influence and shape ecosystems in our area, fire is perhaps the one humans have had the most influence over, both in suppressing and causing.

Recent studies on the Forest and elsewhere in the Appalachians have analyzed the historic role of fire in our ecosystems. By examining basal fire scars in tree trunks using dendrochronology (study of tree rings) and microscopic charcoal in bog and pond sediments, it has been shown that fire was widespread and occurred frequently across our landscape. For example fire scar/tree ring studies at eight sites on or near the Forest show fires occurring at a frequency of approximately 3-9 years from the earliest chronology dates in the mid-1600s to mid-1700s and continued until the 1930s when fires began to be effectively and actively suppressed.

Before European settlement, oak and oak-American chestnut forests on mesic slopes were maintained by a combination of lightning and human-set fires. Many communities and species require fire to sustain populations. Oak and southern yellow pine communities have been major components of these forests for thousands of years. These communities promote and require fire. Recurring fire has been a part of the ecosystem for thousands of years. Fire suppression, coupled with an array of other disturbances (e.g., logging and chestnut blight), has facilitated the increased dominance of shade-tolerant species such as red maple.

Periodic prescribed burning can recreate the ecological role of fire in a controlled manner. A fire regime is the pattern of seasonality, frequency, and intensity of fire that prevails in an area. While fires may have been frequent on the landscape they do vary greatly in their intensity and effects within and between vegetation types. 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 with species such as yellow poplar and hemlock 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. Generally speaking across the Forest, approximately 80% of the acreage had frequent fire while 20% had infrequent and low intensity fire based on forest types.

Fire management strategies support a variety of desired conditions and objectives across the GWNF (e.g., to establish, maintain, control or restore forest vegetation, wildlife openings, open woodlands). The fire program includes determining the response to wildfires (both human-caused and lightning), using prescribed fire to reduce risk of damaging high intensity fires, reestablishing historic fire regimes, and restoring native ecosystems along with the plant and animal species those conditions support.

Wildfires in our area that result from human-caused ignitions have two seasonal peaks, the highest one in April and a lower one in November. These months correspond with weather and fuel conditions that are conducive to easy fire ignition and spread (dry, low humidity, windy and no canopy cover of leaves). Lightning caused fires begin in April and peak from May to July then taper off in September. Most fires are the result of human ignitions, but lightning caused fires range from 12% to almost 45% depending on weather and fuel conditions.

Destructive wildfire can cross and affect all lands and resources regardless of jurisdiction and ownership. With almost 3,000 miles of property boundary line, the GWNF borders a mix of ownerships with residences and personal property, infrastructure, and other high value resources within the wildland urban interface. Above all else in the management of fire is the priority for firefighter and public safety.

Desired Conditions for Fire

DC FRE-01: The forest, influenced by both past climatic and human forces, is a forest with diversity and resiliency that is well-adapted to fire occurrence. Many native oak species and yellow pines continue to be major components.

DC FRE-02: Wildland fire 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 and critical resource values, including soil, air, and water quality, are maintained with no long-term negative impacts.

DC FRE-03: The risk of losing key ecosystem components from the occurrence of high severity wildfire remains relatively low.

DC FRE-04: Fire is used in a controlled, well-planned manner to manage vegetation, restore fire-dependent ecosystems and species, create desired wildlife habitat conditions, and modify uncharacteristic fuel conditions resulting from extended absence of fire and/or tree mortality from non-native insects and disease.

DC FRE-05: Prescribed burning occurs under specific preplanned conditions, considering social concerns with smoke management, public health and safety, and welfare of private property.

DC FRE-06: Wildland urban interface areas have a low risk of destructive wildfire. These areas are managed to reduce the risk of loss of human life, enhance protection of nearby homes and improvements, and provide an area where firefighters can safely conduct tactical operations to stop the spread of a wildland fire.

RECREATION, SCENERY AND CULTURAL RESOURCES

RECREATION

Background

Recreation has been a significant offering of the George Washington National Forest since its designation. Outdoor enthusiasts were drawn to the vast forested lands of the national forest for hunting, fishing, camping, hiking and horseback riding, and later mountain bicycling. As these different user groups demanded additional opportunities, the trail network on the National Forest exploded until it topped 1,000 miles. By the time of the last Plan Revision (1993), the Forest could no longer meet demand for single use trails and, with few exceptions, designated all trails as non-motorized, multiple-use trails. Since then, the various user groups and volunteer organizations have made significant strides in cooperating in their use and maintenance of these trails.

The primary exception to multiple-use trails is the Appalachian National Scenic Trail (AT). The AT was congressionally-designated as a hiker only trail. For policy development and maintenance of the AT, there is a cooperative management system comprised of the federal land managing agencies, the Appalachian Trail Conservancy, and the individual volunteer trail clubs. The AT has a reputation throughout the world as a premier long-distance hiking trail and serves as a model for successful partnerships.

The George Washington National Forest is also a provider of some of the most primitive, dispersed recreation in Virginia. There are designated Wildernesses and additional remote backcountry areas outside of Wilderness. In these areas, users can find solitude and must rely heavily on their own outdoor skills and abilities.

On the other end of the spectrum, the GWNF offers numerous front-country, developed recreation opportunities. After several recreation areas were constructed by the Civilian Conservation Corps, some of which are still enjoyed today, the developed recreation program really took root. Since that time, developed recreation has grown to include family campgrounds, group campgrounds, equestrian campgrounds, family picnic areas, group picnic areas, swimming beaches, boat ramps and launches, interpretive sites, shooting ranges and a designated Forest Service Scenic Byway.

Improvements or expansion of existing recreation facilities and trails, and proposals for new facilities and trails, are screened and analyzed not only against the capability of the physical environment, but also the Forest's financial capability to maintain and sustain its massive recreation program. The George Washington National Forest will work collaboratively with partners and the public in aligning our offering of recreation facilities and opportunities with public demand and desires as well as to achieve financial and environmental sustainability.

Desired Conditions for Recreation

DC REC-01: The Forest provides spectacular scenery, unique ecosystems and adequate access for the American public to use and enjoy the resources and opportunities available. The Forest provides escapes from the urban environment and the rural lands are the "backyard" playgrounds and tourism attractions for many smaller communities. A spectrum of high quality, nature-based outdoor recreation opportunities that reflect the exceptional resources of the Forest and interests of the recreating public are provided in an environmentally sound and financially sustainable basis. The rugged mountain landscapes make premier sightseeing and trail use the focus of recreation.

DC REC-02: Recreational activities contribute to the sustainability of the social and economic values of local communities.

DC REC-03: Transportation infrastructure (interstates; the Blue Ridge Parkway; roads; trails, including the Appalachian National Scenic Trail) facilitates access that is appropriate for the recreation opportunity setting.

DC REC-04: Seasonal flora, waterfalls, streams, and lakes, wildlife, and pristine scenery set the stage for a wide availability and variety of quality outdoor recreation experiences. Lakes, streams, upland forests, and historic sites provide the attraction for day and overnight camping visits by urban recreationists.

DC REC-05: Most of the Forest provides the opportunities for hunting, fishing, camping, and other quality outdoor dispersed recreation experiences. There are many opportunities for visitors to learn about natural and cultural resources and how to recreate responsibly.

DC REC-06: A variety of motorized and non-motorized recreation opportunities are available at different levels of challenge.

DC REC-07: Solitude and primitive recreation experiences are available in wilderness and remote backcountry settings and offer physical challenges with minimal human encounters.

DC REC-08: The general forest area provides a variety of dispersed recreational opportunities (hunting, fishing, driving for pleasure, nature viewing, trails use, etc.). The setting is generally natural appearing, although forest management activities are present. Game and non-game wildlife populations are abundant and support viewing, photography, nature study, and hunting. Many areas of solitude and quiet are found.

DC REC-09: Roads are managed to provide a variety of motorized recreation opportunities for licensed off-highway vehicles to enjoy driving in natural appearing settings. Some roads are maintained for high clearance vehicles. These roads are managed and monitored to absorb moderate to high levels of use while protecting soil, water, and air resource conditions. Roads may be closed seasonally or during inclement weather to protect resources.

RECREATION SETTINGS (RECREATION OPPORTUNITY SPECTRUM)

Background

A recreation opportunity is defined as "the availability of a real choice for a user to participate in a preferred activity in a preferred setting, in order to realize desired experiences," (USDA 1982). 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. On National Forest System (NFS) lands five ROS classes apply that include: primitive (P); semi-primitive non-motorized (SPNM); semi-primitive motorized (SPM); roaded natural (RN); and rural (R). The urban class (U) is not appropriate on NFS lands and there are no primitive classes on the GWNF.

Desired Conditions for Recreation Opportunity Spectrum Settings (ROS)

DC REC-10: The Forest offers a variety of recreation opportunity settings ranging from the highly developed to remote.

DC REC-11: The semi-primitive classes (SPM, SPNM) are characterized by predominantly natural or natural-appearing landscapes. The size of these areas gives a strong feeling of remoteness. Within these settings, there are ample opportunities to practice wildland skills and to achieve feelings of self-reliance. In these semi-primitive settings, the primary mode of travel is foot, mountain bike or horse.

DC REC-12: For a semi-primitive non-motorized recreational opportunity (SPNM), the area is remote. Visitors feel that they are removed or at least distanced from the sights and sounds of human activity. Visitors can find solitude and serenity as well as opportunities for self-discovery, challenge and risk-taking. Access to this area is difficult where travel is by animal or is human-powered. Few opportunities for social interaction exist. Visitors rely on their own backcountry skills and abilities. Other than trails, no facilities are provided for the comfort and convenience of visitors. The land provides a high degree of naturalness with little or no evidence of human-made changes to the environment. Wilderness areas and remote backcountry recreation areas provide most of the SPNM opportunities. The area has high probability of isolation from sights of human activities though an occasional road, power line, or evidence of vegetation manipulation may be seen.

DC REC-13: For a semi-primitive motorized recreational opportunity (SPM), motorized public access is compatible, but may be limited or nonexistent in some SPM areas. Roads open for public use are typically primitive with a maintenance level of 2. More often, public access is by foot, mountain bike or horse. There is a moderate degree of challenge, risk and self-reliance. SPM settings offer visitors some expectation of isolation from sights of human activities though an occasional road, power line, or evidence of vegetation manipulation may be seen. The likelihood for meeting other recreationists is generally low. Visitors may see gated roads or tank traps to regulate access into an area. Other than trails, recreation facilities are rare, limited to resource protection needs and designed to be unobtrusive on the landscape. The area can have a high degree of naturalness. Remote backcountry areas provide a large component of SPM, but SPM can also be found in areas spread throughout the Forest.

DC REC-14: For a roaded natural (RN) recreational opportunity, the area is characterized by predominantly natural appearing landscapes with moderate evidence of the sights and sounds of man. Such evidence usually harmonizes with the natural environment. Motorized access is available. On or near motorized travelways, other national forest visitors may frequently be encountered due to concentrated use. As recreationists move away from motorized travelways within the RN areas, there is about equal probability to see other individuals or groups as to experience solitude. There are ample opportunities to have a high degree of interaction with the natural environment. RN areas often take on a mosaic of development from highly modified areas to pockets of unmodified lands. Developed recreation sites such as campgrounds, picnic areas, shooting ranges, boat launches, trailheads, and interpretive sites may be present within this setting for the enhancement of the visitors' recreational experience or the protection of the site and resources.

DC REC-15: For a rural recreational opportunity (R), these areas are substantially modified although they do have natural appearing elements. Facilities are typically designed for a large number of people and roads are generally paved. Sights and sounds of other people are readily evident. The landscape is often dominated by human-caused geometric patterns; open spaces may dominate the landscape. Facilities are developed for user comfort such as pavement on roads and trails, and convenience amenities within campgrounds. Common facilities within this setting would be developed campgrounds day use facilities, interpretive sites and administrative facilities. Opportunities for solitude, challenge and risk are generally low.

DISPERSED RECREATION (TRAILS)

Background

The George Washington National Forest is becoming an increasingly urban forest. In such close proximity to numerous cities (including Washington, DC, and northern Virginia), towns, colleges and universities, as well as smaller communities, this national forest is uniquely located to serve many people from all walks of life and with various recreation preferences.

Each trail user group has expressed desire, and demand, for more miles of their respective favorite trail use, whether motorized or non-motorized, hiking, mountain biking or equestrian trails. During the 1993 Forest Plan revision process, it was determined that there are not enough acres or human resources available to meet the demand for single use trails. Therefore, the vast majority of the trails on the national forest was, and continues to be, designated as multiple or shared use trails. There are exceptions, of course, such as the hiker-only Appalachian National Scenic Trail, highly developed interpretive trails, and trails where resource damage or potential damage is a concern. Also, all-terrain vehicles are restricted to the three designated motorized trail areas on the GWNF (See Management Prescription Area 7C).

Over the last 16 years, the various user groups have, for the most part, embraced the shared use trail systems. Some volunteer organizations with different recreation preferences now work cooperatively to get projects done and obtain grants for trail maintenance. By sharing trails, each non-motorized user group can enjoy hundreds of miles of trails within the national forest.

The George Washington National Forest currently has about 1,100 miles of system trail. Forest Service trails are categorized by the intended maintenance level. A primitive trail is maintenance level 0 or 1 and may appear to be not much more than a deer path. The range goes up to maintenance level 5 which would be a relatively short paved trail that offers interpretive signs. The majority of trail miles fall in the 2-4 maintenance level range.

Desired Conditions for Dispersed Recreation (Trails)

DC REC-16: The Forest provides trail opportunities for varied interests and skill levels ranging from quality day trips to long distance backpack or saddlepack trips. The trail program is managed from a forestwide perspective and opportunities are offered where they are most responsive to demand, minimize conflicts between recreation user types, and can be managed in an environmentally sustainable and operationally efficient manner.

DC REC-17: Trails are provided across all Recreation Opportunity Spectrum classes that are found on the forest. A range of trail difficulty levels, easy to most difficult, exists as terrain and intended maintenance levels dictate. Visitors have choices between using a high maintenance level trail near the “frontcountry”, a primitive low maintenance trail in the “backcountry”, or a trail in the middle of the range.

DC REC-18: Trails are provided for non-motorized uses such as hiking, horseback riding, mountain biking, and hunting and fishing access; and trails are provided for motorized uses such as all-terrain vehicles and motorcycles. Use of motorized trail vehicles is restricted to designated trails. Motorized trails are open to non-motorized uses.

DC REC-19: For high maintenance level trails, the presence of other visitors is high. Where desired and the level of visitor use warrants, there are restroom facilities for the comfort of visitors. An information kiosk or bulletin board as well as other on-site signs provide clear directions and interpretive messages to and along the trail. These trails are accessible to all users. The trail difficulty rating is 'easy'. There is little or no need to have special outdoor skills prior to using these trails.

DC REC-20: For moderate maintenance level trails, there may be some encounters with other visitors, primarily at or near the trailhead. A vault toilet facility is provided at the trailhead only if needed for the protection of resources. Information boards at trailhead parking areas give some directional signs. Few signs exist along the trail to assure users they are still on the correct trail, to provide directions at an intersection with another trail or a road, and to give mileage to a destination. Blazes are painted along the route to help visitors follow the trail. The trail difficulty rating can range from easy to difficult. Users will be challenged and need to rely on their outdoor skills for trails rated moderate or difficult.

DC REC-21: For low maintenance level trails, there will be few if any encounters with other visitors. A vault toilet facility is provided at the trailhead only if needed for the protection of resources. Information boards at trailhead parking areas give some directional signs, but few if any signs exist along the trail, primarily just at intersections. In non-Wilderness areas, trails are blazed. The trail difficulty rating is moderate to difficult. Visitors are afforded the opportunity to be self-reliant on their outdoor skills in an environment away from comfort and convenience amenities normally found in developed recreation areas. Possessing outdoor skills will be important for visitors in the remote portions of these areas.

DC REC-22: A trail management objective (TMO) is completed for each trail and trails are managed and maintained in accordance with their specific TMOs. Volunteers play an important role in helping to maintain many popular trails. Through either individual or sponsored organization agreements, volunteers actively work with local district personnel to identify and address trail maintenance needs.

LANDSCAPE AND SCENERY

Background

The Forest contains picturesque mountains and valleys of great scenic beauty. The majority of the Forest provides a natural-appearing landscape. The scenic and aesthetic values of the Forest are maintained by meeting Scenic Integrity Objectives (SIOs), using the Scenery Management System process. Scenic Integrity is a measure of the degree to which a natural or cultural landscape is visually perceived to be complete and intact, free from detractions from the natural or socially valued appearance. SIOs are classified as Very High, High, Moderate, Low, Very Low, or No Integrity. The Very Low and No Integrity SIOs are not adopted on the GWNF. The approximate acres of Scenic Integrity Objectives to be maintained are: Very High 45,000 acres, High 424,000 acres, Moderate 579,000 acres, and Low 17,000 acres.

Desired Conditions for Scenery

DC SCE-01: The mountainous George Washington National Forest provides many opportunities for high quality, nature-related scenic viewing and rural culture sightseeing and tourism. Numerous distinctively scenic and historic "special places" of a localized importance are available for people to enjoy. The Forest offers premier opportunities for scenic viewing from trails, roads, rivers and developed recreation sites.

DC SCE-02: The desired conditions for scenery across the forest include intact, natural appearing, predominantly forested mountaintops and side slopes. The valleys are also predominantly forested except for openings for cultural or historic sites, pastoral areas, rivers, developed recreation areas, roads and administrative sites. These natural appearing landscapes include areas such as open woodlands, open wetlands, rock outcrops and talus slopes. Management activities in areas with SIO of Low may have scenery that appears moderately altered.

DC SCE-03: The Scenery Treatment Guide (Chapter 3, Table 3-3) and the scenic integrity objectives (SIO) within the standards of the Plan will provide guidance for mitigating scenery impacts for management activities during project planning and implementation.

DC SCE-04: Disturbances to scenery allow for restoration of the landscape character that was influenced historically by wildfires. Within a variety of prescription areas, a landscape character theme includes a mosaic of openings that appear to have been created by natural wildfire, initially with blackened trees, shrubs, and ground-cover. Visual evidence of fire may persist for years; however, elements that are not natural appearing, such as mechanically constructed firelines, are not visually evident after one year of completing the project. These areas, where the role of fire is restored, have a long-term landscape character goal of predominantly canopied forest and woodland with natural appearing openings that contain a diversity of vegetative layers and species including grass/forbs and other groundcovers, understory, midstory and overstory trees.

DC SCE-05: For a Very High (VH) SIO area, landscapes exist where the valued landscape character is intact and appears natural or unaltered with only minute visual disturbances to the valued scenery. The existing landscape character and sense of place is expressed at the highest possible level. VH generally provides only for ecological changes to be visible in natural landscapes and complete visual intactness of cultural landscapes. The SIO level is achieved immediately upon completion of any projects.

DC SCE-06: For a High (H) SIO area, landscapes exist where the valued landscape character appears intact, natural and unaltered even though disturbances may be present. These deviations remain unnoticed to the casual observer because they have been designed to repeat attributes of form, line, color, texture and scale found in the valued scenery. This SIO level is achieved as soon after project completion as possible or within three years maximum.

DC SCE-07: For a Moderate (M) SIO area, landscapes exist where the valued landscape character appears slightly altered. Noticeable human-created deviations are minor and remain visually subordinate to the landscape character being viewed, because they repeat its form, line, color, texture, pattern and scale. This SIO level is achieved as soon after project completion as possible or within three years maximum.

DC SCE-08: For a Low (L) SIO area, landscapes exist where the valued landscape character appears moderately altered. Deviations begin to dominate the valued landscape character being viewed but they borrow valued attributes such as size, shape, edge effect, and pattern of natural openings.

CULTURAL RESOURCES

Background

The George Washington National Forest contains a multitude of sites representing past human events. The varieties of cultural resources are impressive and include those related to 14,000 years of Native American habitation, the Civil War, the early industrial revolution, and the Civilian Conservation Corps (CCC). Sites that can be visited include an antebellum mansion, breastworks, recreation areas constructed by the CCC and numerous ruins of 19th Century furnaces, to name a few. These sites provide forest visitors a valuable lesson in the history of these lands prior to federal ownership. National Forest lands have been called “the lands that nobody wanted”, but these cultural resources indicate that there were many people throughout history who struggled to survive or thrived making a living off of these lands.

Desired Conditions for Cultural Resources

DC CUL-01: Cultural resources are protected. Those resources that are particularly susceptible to vandalism or looting are not publicly identified on-site. Treatments or mitigating measures are taken to make public access difficult to cultural resources that are particularly vulnerable to vandalism or that require a higher level of protection. However, many cultural resources are openly available for public viewing. Those that are readily accessible along roadways or short trails are the subject of on-site interpretation in the form of signs or programs, and off-site interpretation provided on the forest’s webpage. These interpretive opportunities are

provided to enhance public understanding of and appreciation for the cultural history of the forest. Opportunities are also provided for the public to volunteer with the Passport in Time and other programs, assisting Forest Service archaeologists in a formal "dig" and documentation of a historic or pre-historic site on the national forest.

DC CUL-02: Effective relationships are maintained with Federal, State, Tribal and local governments and historic preservation organizations with interests in the George Washington National Forest to ensure protection of cultural resources and to promote Heritage program efficiencies.

INFRASTRUCTURE – ROADS AND FACILITIES

Background

Facilities include buildings, kiosks, shelters, etc. located on the National Forest, as well as administrative offices and work centers in nearby towns and cities.

There are about 1,800 miles of inventoried and classified National Forest System (NFS) roads currently within the GWNF. These include collector and local roads of various levels ranging from an Operational Maintenance Level (OML) of Basic Custodial Care to High Degree of User Comfort.

The majority of road work currently performed on the Forest consists of reconstruction of existing roads. New roads are sometimes required, but typically, existing roads are reconstructed if their location and layout are suitable for the currently existing need and the existing layout provides for minimal risk of resource damage. It is also necessary, at times, to decommission roads that are no longer required or are causing damage to other natural resources. About 160 miles of road have been identified as potentially available for decommissioning.

Two types of roads on the Forest are used predominantly for other than Forest access. One of these (about 50 miles) includes roads that access special use permits. The other type is used to travel through the Forest from a destination off the Forest to another location, also off Forest. Common examples include work and school commuters who use these roads as shortcut access to jobs or to school locations. In these cases, it is often more desirable to bring the road to minimum State standards and turn the road over to the respective State Departments of Transportation for maintenance. Without exception, the State Departments of Transportation are better equipped and better funded to provide a higher level of maintenance and service for these roads. This maximizes efficiency of application for the limited funding received by the Forest Service for road maintenance and allows for better maintenance of those access routes, which are predominantly used for through-Forest access. About 130 miles of this type of road have been identified.

The road system needed on the GWNF to meet Forest access needs has been identified as about 1,477 miles, not including the special use roads and roads potentially available to become forest highways (turned over to the State). The following maintenance levels are provided to National Forest System roads.

Table 2-7. Operational Maintenance Levels of Forest Roads

Operational Maintenance Level	Miles
Maintenance Level 1 – Closed, in storage for future use	151
Maintenance Level 2 - High Clearance, seasonal or administrative use	1,005
Maintenance Level 3 - Passenger Car	281
Maintenance Level 4 - Passenger Car, collector	32
Maintenance Level 5 - Passenger Car, 2-lane, paved, arterial	8
Grand Total	1,477

Desired Conditions for Roads and Facilities

DC RDF-01: A minimal transportation system is provided that supplies safe and efficient access to the GWNF for forest users while protecting forest resources. The desire for motorized access to the Forest is balanced against conflicting goals of providing for certain types of diverse wildlife habitat and non-motorized recreation use. Roads serve a variety of needs including access for recreational purposes, fire protection, vegetation and wildlife management, access to facilities, access to private land inholdings, and energy and mineral development.

DC RDF-02: Public motorized access occurs only on designated roads and trails and as indicated on the Motorized Vehicle Use Map (MVUM). Motor vehicle designations include parking along designated routes and at facilities associated with designated routes when it is safe to do so and when not causing damage to National Forest System resources.

DC RDF-03: Roads that are no longer needed have been decommissioned. Roads that are not needed for an extended period of time have been closed, stabilized and have native vegetation cover.

DC RDF-04: Permanent vegetation is established on roadbeds of intermittent service roads. Cut and fill slopes of all roads have permanent vegetation established.

DC RDF-05: Facilities reflect the natural and cultural landscape, and provide optimal service to customers and cooperators. They are in good condition, safe, clean, structurally sound, energy efficient and accessible to all users.

LANDS AND SPECIAL USES

Background

Special use authorizations provide for those private uses of Forest lands that are necessary to serve the public interest and which cannot be accommodated on non-Federal land. This includes Forest lands used for utility corridors and transmission lines, communication sites, military training activities, outfitter guides, organizational camps, and recreation special events such as fishing tournaments and marathons. These special uses serve a public benefit by providing for public access, transportation efficiency for commerce, a reliable supply of electricity, natural gas, and water, and a communication network. Generation of power from wind and solar energy may be national forest special uses of the future.

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 fishing tournaments, foot races, horse endurance races, and mountain bike races.

The utility corridors designated as Management Prescription Area 5C are linear areas 50 to 1,000 feet wide to accommodate access for maintenance and facilitate co-location of new utilities, and include all existing utility rights-of-way 50 feet wide and larger under special use permit. Local energy distribution lines are smaller in scope and are a part of the management area in which they are physically located. Communication sites are designated as Management Prescription Area 5B and are usually located on mountain and ridge tops.

The Secretary of Agriculture is authorized to issue permits, leases, and/or easements for transportation and utility rights-of-way and communication uses on National Forest System lands by the Federal Land Policy and Management Act of 1976 (P.L. 94-579), and the Mineral Leasing Act of 1920, as amended (P.L. 66-146).

The Lands program consists of the acquisition, disposal and exchange of lands to meet resource management needs as well as maintaining around 3,000 miles of landline boundary between National Forest System lands and private lands.

Desired Conditions for Lands, Special Uses, Communication Sites and Utility Corridors

Lands

DC LSU-01: National Forest System lands are consolidated and provide reasonable access and efficiency of land management. Encroachments are none to few. No isolated forest tracts without legal access exist. Many small National Forest tracts surrounded by private lands are generally accessible to the public.

DC LSU-02: The majority of Forest lands identified for exchange are lands that are attractive to private individuals, thus allowing for acquisition of other desirable parcels.

DC LSU-03: Lands identified for acquisition are primarily in-holdings or adjoining parcels which are partially surrounded by Forest lands which will aid in consolidating National Forest System lands.

DC LSU-04: The Appalachian National Scenic Trail has legal access and is sufficiently protected from developments which would detract for the Trail experience.

DC LSU-05: Landlines and property corners are established to Forest Service standards. Landlines are easily locatable and highly visible.

DC LSU-06: Private land improvements are not constructed on National Forest System lands as a result of erroneous surveys. No land title claims or encroachments exist.

Special Uses

DC LSU-07: Special uses exist that serve a local, regional or national public benefit and need by providing for public access, transportation efficiency for commerce, military training, a reliable supply of electricity, natural gas, water and alternative forms of energy, competitive and non-competitive recreational events, outfitting and guiding services, and communication networks.

DC LSU-08: Special uses occur that serve an individual (private) benefit by providing access to private land.

DC LSU-09: The number and acreage of special use authorizations for individual (private) use do not increase rapidly over current numbers; with terminated uses tending to offset new uses.

DC LSU-10: Existing flood control dams are maintained in good working order per provisions in the special use permit.

DC LSU-11: The Virginia Power Bath County Pumped Storage Project remains operational.

DC LSU-12: Wind energy applications are considered a request for a special use permit.

Communication Sites

DC LSU-13: Each site is developed and utilized to its greatest potential in order to reduce the need to develop additional sites. All users' equipment blends visually with forest surroundings. All users' equipment and frequencies coexist. New equipment is as inconspicuous to the surrounding terrain as possible. Vegetation consists predominantly of low grasses and wildflowers with some native deciduous and evergreen shrubs and scattered trees. For the most part the areas are on gently rolling terrain, some with exposed surface rock, rock outcrops, and meandering streams.

DC LSU-14: Obsolete sites have been rehabilitated and blend into the surrounding landscape with native vegetation.

Utility Corridors

DC LSU-15: Each utility corridor is developed and utilized to its greatest potential in order to reduce the need to develop additional corridors.

DC LSU-16: Utility corridors retain low growing vegetation which conforms to the safe operating requirements of the utility and which reduce surface water runoff and erosion. Vegetation consists predominantly of grasses and wildflowers, low-growing native deciduous and evergreen shrubs, low-growing trees like dogwood and redbud, and young, sapling-sized trees. These corridors also provide open habitat conditions for wildlife.

TIMBER MANAGEMENT

Background

Timber and other wood products are a byproduct of habitat management activities as well as a purpose for timber management on lands suitable for production. The following desired conditions apply to lands suitable for timber production.

Desired Conditions for Timber Management

DC TIM-01: Forested stands are healthy, vigorous, of appropriate stocking levels and desirable species composition, and free to grow from competing less desirable trees on lands suitable for timber production. A regenerated forest stand contains tree species that commonly occur or have historically occurred naturally on similar sites within that ecosystem. Regenerated stands contribute to a variety of age classes and facilitate an even flow of wood products for societal use that benefit the local economy.

DC TIM-02: Timber harvesting is used in a controlled, well-planned manner to manage vegetation, restore or create wildlife habitat conditions, reduce uncharacteristic fuel loads resulting from extended absence of fire and/or tree mortality from non-native insects and disease.

DC TIM-03: On areas suitable for timber production, trees and the products derived from them are a highly valued forest resource, carefully managed to achieve the desired condition of a given area in a cost-effective manner. For societal use, forest products vary from high quality veneer and boards for furniture and flooring to small diameter pulp logs used in the production of paper, wood biomass energy, and personal use firewood. A stable supply of wood products contributes to the social and economic well-being of the people living in the area and helps maintain a way of life long associated with those living within the area.

DC TIM-04: The ecological value of leaving dead, dying, and damaged trees as a natural part of the ecosystem is balanced with aesthetic desires and economic values of the timber resource that can be used for fuelwood, wood biomass energy, pulpwood, or sawtimber if removed prior to deterioration or its value being lost.

MINERAL RESOURCES

Background

Congress authorized the National Forests to help meet public demand for energy and non-energy minerals. The National Forests and the Bureau of Land Management have wide-ranging, multiple benefit missions. Congress established the roles of the Forest Service and the Bureau of Land Management in implementing the federal leasable mineral program, which on the George Washington National Forest currently involves about 10,200 acres of federal oil and gas leasing. Since 1980 a few exploration wells have been drilled on the George Washington National Forest, but the wells did not find commercial deposits of oil and gas. New exploration targets, such as the Marcellus shale, are potential exploration targets in the future.

The Forest also is authorized to manage building stone, landscaping rock, aggregate, rip rap, and other rock or earthen materials under the federal mineral materials program. The Forest uses mineral materials to meet

desired conditions for a wide variety of resource management. Mineral materials are essential to build and maintain the Forest's roads, trails, and other infrastructure. Like firewood, mineral materials also may be sold to the public, and can be provided free to public agencies, such as state highway departments.

A continuing supply of energy and non-energy minerals is essential to manage the Forest and for public use and enjoyment of the Forest. This continuous supply of minerals originates mostly from local, regional, national, and international sources off the Forest, but the Forest also has opportunities to supply a part of the minerals required to manage the Forest and for public use and enjoyment of the Forest.

Desired Conditions for Mineral Resources

DC MIN-01: The Forest's mineral resources help meet identified public demand for energy and non-energy minerals.

DC MIN-02: The Forest's mineral materials (aggregate, rip rap, gabion rock, building stone, landscaping rock, etc.) are utilized to: help build and maintain trails, roads, campgrounds, and watershed improvement projects; control erosion and sedimentation; restore riparian and aquatic habitat; prevent or repair flood damage; for other uses to manage and sustain the Forest; and help meet public demand and other governmental agency needs.

DC MIN-03: On National Forest System tracts where mineral rights are private (outstanding or reserved rights), the exercise of private mineral rights to explore and develop mineral resources is respected, and the Forest Plan direction is subject to the valid existing rights. When private mineral rights are exercised, operations are using only as much of the surface as is reasonably necessary and impacts to other resources are minimized.

DC MIN-04: Looking across the Forest at all mineral operations, federal or private, the total area of ground disturbance from mineral operations is less than one-half of one percent of the Forest.

DC MIN-05: All operations are reclaimed, and when possible, reclamation is used to enhance the desired condition for other resources, such as wildlife openings, ponds for wildlife, parking for recreation, staging area for firefighting and helicopters, etc. Reclamation also can be seen at historic abandoned mines.

DC MIN-06: Collection of geologic materials for scientific or educational purposes and recreational rock hounding may occasionally be seen.

RANGELAND RESOURCES

Background

There are currently three active grazing allotments: the Moody and Whiting Tracts along the Shenandoah River and the Zepp Tannery Tract on Cedar Creek.

Desired Conditions for Rangeland Resources

DC RGE-01: A landscape that includes pastoral landscapes and bottomland hardwoods exists.

DC RGE-02: Healthy forage for domestic livestock and valuable grassland/shrubland habitat for various wildlife species is provided.

DC RGE-03: Rangelands are not contributing to the degradation of water quality, aquatic species, or threatened, endangered or sensitive species habitat.

CHAPTER 3 – STRATEGY

LAND ALLOCATION STRATEGY

The 1982 planning regulations guiding implementation of the National Forest Management Act call for lands and waters to be assigned to "management areas" (36 CFR 219.11). Management prescription areas are areas within a national forest having common biological, physical, watershed and social conditions, desired conditions, suitable uses, management objectives, and design criteria (standards). Taken together, these attributes constitute the "prescription" for a management area. The desired conditions and standards that apply to each management prescription area are described in Chapter 4.

It is important to note that the same area of land could be allocated to several Management Prescriptions, such as a Special Biological Area that occurs within a Designated Wilderness or the Appalachian National Scenic Trail Corridor that passes through a Designated Wilderness. The management prescription that has the most stringent management requirements is the one allocated to the area and is the one shown on the Management Prescription Areas map that accompanies this Forest Plan. Therefore, Table 3-1 includes the acreage of a Special Biological Area that occurs within a Designated Wilderness area as part of the acreage for Designated Wildernesses and not Special Biological Areas. Actual acres are provided in the background descriptions for each Management Prescription Area in Chapter 4.

Table 3-1. Land Allocation of Management Prescription Areas, as mapped hierarchically

Code	Management Prescription Area Description	Rx Map Acres*
1A	Designated Wilderness	43,000
1B	Recommended Wilderness Study Areas	27,000
2C2	Eligible Wild and Scenic Rivers-Scenic	2,000
2C3	Eligible Wild and Scenic Rivers-Recreation	4,000
4A	Appalachian National Scenic Trail Corridor	9,000
4B1	Research Natural Areas (actual 3,900 acres)	2,000
4C1	Geologic Areas	3,000
4D	Special Biological Areas (actual 63,000 acres)	53,000
4D1	Key Natural Heritage Community Areas	3,000
4E	Cultural Areas	<100
4F	Mount Pleasant National Scenic Area	8,000
4FA	Shenandoah Mountain Recommended National Scenic Area	67,000
5A	Administrative Sites	<100
5B	Communication Sites	<100
5C	Utility Corridors	7,000
7A1	Scenic Byways	5,000
7B	Scenic Corridors and Viewsheds	34,000
7C	ATV Use Areas	10,000
7D	Concentrated Recreation Zones	1,000
7E1	Dispersed Recreation Areas – Unsuitable for Timber Production	24,000
7E2	Dispersed Recreation Areas – Suitable for Timber Production	4,000

Code	Management Prescription Area Description	Rx Map Acres*
7F	Blue Ridge Parkway Corridor	4,000
7G	Pastoral Landscapes	4,000
8E4a	Indiana Bat-Primary Conservation Areas	2,000
8E4b	Indiana Bat-Secondary Conservation Areas	14,000
8E7	Shenandoah Mtn Crest-Cow Knob Salamander (actual 58,000 acres)	24,000
11	Riparian Corridors (actual 51,000 acres)	Not mapped
12D	Remote Backcountry Areas	201,000
13	Mosaics of Habitat Areas	508,000
	Water – Lake Moomaw	2,500
Total Acres		1,066,000

* The acres represent the most stringent management prescription. For example, Special Biological Area acres that occur within a Designated Wilderness are included in the acres shown above for Designated Wilderness.

MANAGEMENT APPROACH AND OBJECTIVES

The Management Approach is a summary of management actions that will be used to move the Forest towards the desired conditions identified in Chapter 2. The management approach is not a required section of the plan and is not binding but it provides a framework to describe the measures expected to be used within our current and anticipated levels of funding, staffing and partnerships opportunities.

Objectives identify the measures projected to be implemented to move the Forest toward the desired conditions. They are concise, time-specific statements of measurable planned results. An objective forms the basis for further planning to define the precise steps to be taken and the resources to be used in achieving Forest Plan direction. These objectives are strongly influenced by recent trends, past experiences, current staffing levels, and anticipated near-term budgets. They express what we believe can realistically be achieved over the next 15-year planning period for this Plan.

WATERSHED RESOURCES (WATER, SOIL, AIR, AND GEOLOGY)

Management Approach

The achievement of desired conditions for healthy watersheds is a combination of maintaining, restoring, and monitoring the soil, water, air and geologic resources on the GWNF. Much of the impacts to water resources are due to activities upstream or downstream from the areas managed by the Forest Service. Groundwater and air quality issues also cross national forest boundaries and are affected by multiple region-wide impacts such as increased agricultural use, growing urban development, cumulative effects from regional emissions and discharge sources, and slow recovery from past actions. Therefore, our strategy is to focus on sustaining and improving watershed areas within national forest control while working cooperatively with other agencies and landowners to improve statewide watershed health.

Producing favorable flows of water was one of the purposes of the Weeks Act when it was passed in 1911 to allow the purchase of lands to become National Forests. At the 100th anniversary of this Act, the Forest continues to emphasize protection of water quality and quantity to meet the needs of Forest resources and of downstream water users. The management approach begins with protection of the aquatic systems and adjacent terrestrial lands, the floodplains and riparian areas with a management prescription area that incorporates all of the protections of the Federally Listed Threatened and Endangered Mussel and Fish Conservation Plan previously developed to protect threatened and endangered aquatic species. Watershed

management continues with the identification of priority watersheds, which highlight those watersheds with sensitive aquatic species, currently identified water quality concerns due to private land or natural causes (impaired streams), and public water supplies. The list of priority watersheds may change over time as new sensitive species are identified or as water quality concerns are abated. The current list, with a more detailed description of the selection process, is in Appendix D.

These priority watersheds will be a priority for inventorying soil and water improvement needs, restoring streams and streamside systems to fully functioning systems, restoring habitat for sensitive aquatic and riparian species, addressing opportunities to reduce impacts from roads through relocation or decommissioning, and evaluating any new proposals for special uses that could affect water quality. Protecting these watersheds is a cooperative effort, so proposed actions in these watersheds will be closely coordinated with partners such as State agencies and local communities dependent upon the water.

Public Water Supply watersheds as identified by the Commonwealth of Virginia for North River, Dry River and Skidmore Fork (and the watershed upstream of the Dry River PWS), Pedlar River (and watershed upstream of Pedlar River), Smith Creek, North Fork of Shenandoah, North Fork Shenandoah-Cedar Creek, Jackson River, and Coles Run are not suitable for oil and gas leasing.

Management of healthy forests to make them more resilient to impacts from climate change, increased development and other disturbances is another key to watershed management. Desired conditions and objectives for the ecological systems will also enhance watershed conditions. The Forest will continue to work cooperatively with other agencies, groups and individuals to strengthen actions to protect and highlight water quality on the forest and on adjacent lands. These cooperative actions will highlight drinking water watersheds and management within the Chesapeake Bay watershed. Many of the standards developed for management prescription areas were developed to ensure that management activities that occur outside the riparian areas are also designed and implemented to protect water quality. Road management decisions regarding maintenance levels, seasonal closings, decommissioning and construction will all be done after careful consideration of potential impacts to water quality. Water monitoring will continue to be implemented to assure that streams are maintained in a condition to support the diverse aquatic communities in the Forest streams. As the largest Federal land manager in the Bay watershed, the Forest fully supports measures like the current EPA841-R-10-002, Guidance for Federal Land Management in the Chesapeake Bay Watershed, Executive Order 13508, Federal strategy to “protect and restore” the Bay watershed and the Chesapeake Bay Total Maximum Daily Load for Nitrogen, Phosphorous and Sediment, EPA 2010.

Soil productivity on the Forest can be affected by activities that disturb the soil surface such as vegetation management projects, fire management, and use of trails and roads. Each national forest has distinct soil characteristics that must be managed appropriately to avoid erosion, compaction, rutting, and drainage issues. Our management strategy for protecting soil condition is to use Virginia and West Virginia Best Management Practices (BMPs) and match national forest activities with specific soil types and topography to minimize erosion. Use of riparian standards to protect wetland communities and perennial, intermittent and channeled ephemeral streams, restrictions on mechanical equipment operation, installation of water diversions, and careful designing and engineering of roads and firelines are just a few of the BMPs that are used during ground disturbing activities on the GWNF.

Soils that are determined to be low in natural fertility and have low buffering capacity to acid deposition will be managed to ensure that any planned activities will not affect the long-term productivity of the land. Woody biomass (defined as vegetation removed from the forest, usually logging slash, small diameter trees, tops, limbs or trees not considered merchantable in traditional markets) utilization will be limited on soils identified as high risk for soil acidification and nutrient depletion due to atmospheric deposition. High risk soils are determined by using atmospheric deposition, elevation and geologic data as well as vegetation and soils information.

On the GWNF, prescribed burning is the management activity most likely to contribute to air emissions. The prescribed burning levels associated with returning the Forest to more historic fire conditions will require an increase in forestwide prescribed burn acreages from recent years. This increase in prescribed burning was anticipated and the Forest worked with Virginia Department of Environmental Quality (VDEQ) and other state

air agencies to incorporate these increases into the emissions inventory used by VDEQ for Regional Haze and Ozone State Implementation Plans. Air modeling analyses projected out to 2018 show that even with the increase in prescribed fire emissions on the Forest, the State should be able to attain National Ambient Air Quality Standards (NAAQS) and show reasonable progress in visibility improvement. It is the intent of the Forest to maintain a working relationship with VDEQ to ensure that emissions from Forest activities continue to be appropriately incorporated into future emissions inventories. Smoke management procedures will continue to be integrated into our fire management activities to improve regional air quality.

The Forest will continue to participate with state agencies and the EPA in evaluating new air pollution permits and procedures to address existing air pollution with the intent of continuing to show improvement in visibility and to restore resources adversely affected by acid deposition.

Major geologic resources, such as known caves, are managed as a separate management prescription area (4C1) designed to protect these sensitive resources. As geologic hazards are identified, site-specific plans are prepared to address the hazard. Karst areas and caves are protected with standards. Special Uses permits, land adjustments, and applications for permits to drill for gas and other management activities that could affect groundwater resources are evaluated for their potential to affect groundwater quality. Design of management activities are based on recognition of lithologic diversity and other geologic diversity that are the foundation of, and requirement for, biological diversity. Lithology and other geologic components are incorporated into assessments and management responses to acid precipitation and climate change. For Forest Service projects, use of mineral material sources on the Forest will be considered to reduce costs and reduce the carbon footprint of using off-Forest sources.

Planning for all Forest projects and resource management plans and activities (including grants and agreements, special uses, and interagency agreements) should determine: 1) whether the affected lands are subject to reserved or outstanding mineral rights; and 2) if so, whether these private mineral rights may affect or be affected by the proposed action.

Objectives for Watershed Resources

OBJ WTR-1: To provide appropriate instream habitat, aquatic organism passage, water quality, riparian habitat, or healthy biological communities for desired aquatic species, 250-350 miles of streams per decade are restored, sustained or enhanced.

OBJ WTR-2: To provide appropriate lake habitat, aquatic organism passage, water quality, riparian habitat, or healthy biological communities for desired aquatic species, 250-350 acres of lakes per decade are restored, sustained or enhanced.

OBJ WTR-3: Streamsides are managed in a manner that restores and maintains amounts of Large Woody Debris (LWD) sufficient to maintain habitat diversity for aquatic and riparian-dependent species (approximately 200 pieces[1] per stream mile).

OBJ WTR-4: Watersheds are managed in a manner that results in sedimentation rates that stabilize or improve the biological condition category of the stream as monitored using aquatic macroinvertebrates.

OBJ WTR-5: Improve watershed and soil conditions across 450-550 acres per decade. Priority for treatment will be given to watersheds listed as Priority Watersheds and areas identified in Forest project priority criteria and annual work planning.

[1] A piece of LWD is defined as a piece of wood at least partially within the bank full channel width, with a diameter of at least 4 inches (10 cm), and length of at least 4 feet.

ECOLOGICAL SYSTEMS DIVERSITY

Management Approach

The main strategy for moving toward desired conditions for ecosystem diversity is to manage vegetation structure and composition to support healthy, functioning ecological systems. However, for the rare communities the main strategy involves establishment of Special Biological Areas where the primary goal is to restore and maintain the rare community. Implementation strategies will be developed for some Special Biological Areas to identify any needed management actions and monitoring. Most of the ecological systems are represented on the landscape where they would be expected.

The GWNF, for the most part, does not have major ecotypes that were converted to other forest types from previous activities. Forest vegetation structure and composition of the understory, however, are often key features in need of restoration. Part of the vision of this Plan is to create open woodland settings and forest structures to support native plant and animal species by mimicking disturbances within the natural range of variability. Management is directed at developing landscapes that represent typical disturbance regimes for each ecological system. For instance, restoration of historic fire regimes, including appropriate return intervals, seasonality, and intensity, is inherent to sustaining native ecological systems such as Pine Forests and Woodlands. While it may take many decades to completely achieve these ecosystem conditions, actions initiated during the next 15 years covered by this Plan will set the stage for continued progress.

The Spruce Forests system is currently limited to the Laurel Fork area. This system occupies about one-half of the area where it likely has the potential to exist. While the system is very limited on the GWNF, in adjacent West Virginia and on the Monongahela National Forest, it is more extensive. The greatest stresses and threats to this system include climate change and acid deposition. Strategies for restoring and maintaining the Spruce Forests system should emphasize restoring spruce to those sites where Norway spruce and red pine have been planted and maintaining conditions favorable to continued growth of existing stands. The Laurel Fork area should continue to be managed to restore and maintain the Spruce Forests by planting red spruce seedlings and releasing red spruce seedlings that are suppressed by hardwoods.

Forest strategies for restoring, maintaining, and enhancing the Northern Hardwoods Forest ecological system should emphasize maintaining this system on the lands where it occurs. Some regeneration management activities could take place, but it would not be a high priority. Stresses and threats to this system include climate change, acid deposition and invasive species (hemlock woolly adelgid).

The management strategy for the Cove Forests is to utilize timber harvest to approach the early successional habitat objective since fire is not a common disturbance in this system except in the driest of conditions. The greatest stress and threat to this system are invasive plants due to the moist, rich soil conditions of these sites.

Forest strategies for maintaining and enhancing the Oak Forests and Woodlands systems will integrate the use of timber harvest and fire. These management tools can occur independently or together on the same acres. The greatest stresses and threats to the oak forest and woodlands system are the lack of open conditions needed to establish and maintain oak reproduction and the competition of faster growing species due to the exclusion of fire or infestations of non-native invasive species. We will rely heavily on utilizing fire to restore and maintain more open canopy conditions and grassland/shrublands. Timber harvest will be another frequent technique of creating regenerating forests and creating desired more open canopy conditions. Given its importance as a food source for many wildlife species, maintaining a high percentage of oak in ages that produce mast is also important. Planting American chestnut that is resistant to the Asian chestnut blight is an important restoration activity that would occur mostly in these systems.

Grassland/shrublands will also be maintained through direct creation and maintenance activities, such as periodic mowing.

Fire will be the prime strategy for maintaining and enhancing the Pine Forests and Woodlands systems. Timber harvest will also be used to a lesser extent for regeneration. Restoration of short-leaf pine by planting is a restoration strategy that would be focused on where it historically occurred on the landscape. The greatest stresses and threats to this system are lack of disturbance to create regeneration and open woodland structure, invasive species including the native pine bark beetle, and climate change that could reduce rainfall and make insect outbreaks more common.

Forest strategies for maintaining, and enhancing the Mafic and Alkaline Glades systems include prescribed fire and managing wildfire, control of non-native invasive plants, and monitoring and managing recreation use in the areas. These systems are uncommon on the Forest so their limited distribution is a stress. Other important stresses and threats to these systems include the lack of fire, non-native invasive plants, and trampling from excessive recreation use.

Forest strategies for maintaining and enhancing the Cliff, Talus and Shale Barrens systems include prescribed fire and managing wildfire, control of non-native invasive plants, managing deer browsing, and monitoring and managing recreation use in the areas. The major stresses and threats to these systems include the lack of fire, non-native invasive plants, problematic native species (deer browsing), trampling from excessive recreation use, and altering the normal disturbance regimes that maintain the character of the cliff, talus and barren features (rock slides, stream erosion).

Forest strategies for maintaining and enhancing the Caves and Karstlands system include management, primarily through the use of Forest Plan standards, to maintain the hydrology and protect the water quality in areas draining into cave systems or in karst terrain. The greatest threats or stresses on this system are alteration of the hydrology that supports the system and degradation of water quality. This includes changes to the groundwater and surface water flow and human caused impacts to water quality such as improper pesticide use or disposal of harmful materials in sinkholes. These features are protected both from recreational damage and from polluted water, which, in turn, protects the species that depend on them. Monitoring of cave use and gating caves when needed to protect cave features and the biota are also components.

The management approach for the Floodplains, Wetlands and Riparian Areas ecosystem is defined by the desired conditions and standards for the Management Prescription Area 11-Riparian Corridors.

During the development of projects to move the Forest towards the desired ecological conditions, project objectives may be developed based on the individual ecological systems (such as Southern Appalachian Oak Forest), rather than the ecological system groups (such as Oak Forests and Woodlands) that are described in Chapter 2 of the Plan.

Objectives for Ecological Systems Diversity

Regeneration

OBJ ESD-1: Approximately 18,000 acres to 30,000 acres of forest will be in the 0-10 year age class from regeneration harvest by the end of the first decade. Of this regeneration:

- The majority of this would be created in the Oak Forests and Woodlands system.
- A maximum of 1,000 acres would be created in the Northern Hardwoods system.
- A maximum of 2,400 acres would be created in the Cove Forests system.
- A maximum of 16,000 acres would be created in the Pine Forests and Woodlands system.

Mid-Late Successional Habitat

OBJ ESD-2: The following acreage of each ecological system will be in mid-late successional stages by the end of the first decade:

- Approximately 12,000 to 13,000 acres of the Northern Hardwoods system.
- Approximately 57,000 to 59,000 acres of the Cove Hardwoods system.
- Approximately 141,000 to 157,000 acres of the Pine Forests and Woodlands system.
- Approximately 690,000 to 710,000 acres of the Oak Forests and Woodlands system.

Spruce Forests Ecological System

OBJ ESD-3: The current acreage of approximately 600 acres of the Spruce Forests ecological system is maintained and additional spruce sites are reestablished to a total of about 1,300 acres. Areas in Laurel Fork where red pines have been planted should be restored to red spruce.

Northern Hardwoods Forests Ecological System

OBJ ESD-4: The area of the Forest represented by the Northern Hardwoods Forest ecological system remains essentially the same, although a small portion (about 800 acres) could be restored to Spruce Forests.

Cove Forests Ecological System

OBJ ESD-5: The area of the Forest represented by the Cove Forests ecological system remains essentially the same.

Oak Forests and Woodlands Ecological System

OBJ ESD-6: The area of the Forest represented by the Oak Forests and Woodlands ecological system remains essentially the same; however, there will be a slight shift in acres from oak-pine systems to pine-oak and pine systems as the use of fire increases. By the end of the first decade:

- Approximately 90,000 acres of forest are in open canopy conditions to maintain forest health and sustain foraging and nesting opportunities for species.
- An estimated 74,000 acres of this fire-dependent ecosystem have received a fire return interval of 5-15 years.
- Approximately 8–10% of the open canopy creation and regeneration acres has occurred at elevations greater than 3,000 feet.
- Approximately 1,000 acres of forest are planted to American chestnut. Most of this planting will occur in the Oak Forests and Woodlands system.
- To restore the ecological health of the forest, one American chestnut research and restoration (seed orchard) site is established on the forest and 1 to 4 American chestnut restoration projects per district are developed in partnership with other American chestnut support organizations.

Pine Forests and Woodlands Ecological System

OBJ ESD-7: The area of the Forest represented by this ecological system remains essentially the same; however, there will be a slight shift in acres from oak-pine systems to pine-oak and pine systems as the use of fire increases. By the end of the first decade:

- Approximately 18,000 acres of previously closed canopy stands are in open canopy condition to maintain forest health and sustain foraging and nesting opportunities for species.
- An estimated 18,000 acres of this fire-dependent ecosystem have received a fire return interval of 3-8 years.
- Approximately 8–10% of the open canopy creation and regeneration acres has occurred at elevations greater than 3,000 feet.
- Approximately 800 acres are returned to shortleaf pine forests.

Alkaline and Mafic Glades and Barrens Ecological System

OBJ ESD-8: An estimated 3,000 acres of Central Appalachian Alkaline Glades and Woodlands and 700 acres of Mafic Glades and Barrens on the Forest continue to be present. By the end of the first decade, 30% of these systems are at their desired conditions in regard to fire regime, non-native invasive species control, open structure and lack of recreation impacts.

Cliff, Talus and Shale Barrens Ecological System

OBJ ESD-9: An estimated 14,000 acres of the Cliff, Talus and Shale Barrens ecological system on the Forest continue to be present. By the end of the first decade, 25% of the shale barren systems are at their desired conditions in regard to fire regime, non-native invasive species control, open structure and lack of impacts from deer and recreation.

Floodplains, Wetlands and Riparian Areas Ecological System

OBJ ESD-10: An estimated 51,000 acres of Floodplains, Wetlands and Riparian Areas on the Forest continue to be present and functioning. Some wetland systems have increased in extent due to beaver activity.

Caves and Karst Ecological System

OBJ ESD-11: Human impacts on caves are not adversely affecting the hydrology or biology of any caves.

Special Biological Areas (SBAs)

OBJ ESD-12: Develop strategies for management of 3-5 SBAs annually. Based on periodic monitoring of known special biological areas, identify management activities needed to maintain, enhance or restore the habitat of threatened, endangered, sensitive, and locally rare species, and implement an annual program of work designed to meet these needs.

SPECIES DIVERSITY

Management Approach

As noted throughout the Plan, managing for ecosystem diversity is integral to providing appropriate ecological conditions for a diversity of plant and animal species. In addition to relying on management strategies for ecosystem diversity, species habitat conditions are dependent on a variety of integrated resources and management activities. Management strategies for soils, water, fire regimes, vegetation management, infrastructure, and other resource areas also contribute to healthy conditions for a diversity of plants and animals.

Protection and conservation of threatened and endangered (T&E) species drive much of the Plan direction and are a fundamental part of the overall management strategies for species diversity. The T&E species have recovery plans, and the strategy is to follow the finalized plans. The program priorities for T&E species include:

- Implement Forest Service actions as recommended in final recovery plans for federally listed species. In the absence of an approved recovery plan, implement and, if necessary develop interim Forest Service conservation measures. Update interim conservation measures as needed when new science becomes available.
- Work with USFWS and other conservation partners to develop recovery plans for new federally listed species and candidate conservation agreements for species proposed for listing.
- Coordinate with partners to implement measures to resolve conflicts with threatened and endangered species and their habitats.
- Cooperatively monitor trends in population and/or habitat of federally listed species. Amend the Plan as needed when new populations are found.

An important aspect of managing habitat for species is the cooperative work with the Virginia Department of Game and Inland Fisheries, the Virginia Department of Conservation and Recreation Natural Heritage Program, the West Virginia Division of Natural Resources, and US Fish and Wildlife Service. The GWNF will continue the long tradition of working closely with these agencies in all management of species and habitat. This includes work to meet the strategies outlined in each state's wildlife conservation plans and their plans for management of game species.

Most species needs are covered by plan components for ecosystem diversity and documented in the Ecosystem Diversity Report (FEIS, Appendix E). However, in some circumstances, species require additional plan components specific to their needs. These species and the plan components that address their needs are described and documented in the Species Diversity Report (FEIS, Appendix F). The management approach for these species includes additional objectives and standards. Most of these were developed to meet the needs of groups of species with similar habitat needs or management strategies. The following strategies were developed for the species identified in the Species Diversity Report as belonging to each group.

Calciphiles. The communities that are most representative of the calciphile associates are established as Special Biological Areas. These include all the areas recommended by the Virginia Natural Heritage Program. As additional significant areas are identified they will be added as Special Biological Areas.

Cavity or Den Tree Associates. Cavity and den trees are generally not limiting and with the increasing age of trees in most of the ecological systems, cavity and den trees will become even more common. The key characteristics for this group are recruitment of new den/cavity trees and retention of existing trees, particularly in areas where management activities are planned. This will be done through the use of den/cavity tree and snag desired conditions and standards.

Cliff, Talus and Rock Outcrop Associates. Cliff, talus and large rock outcrop areas have specific desired conditions and standards. These areas will be managed to enhance habitat for threatened, endangered, sensitive and locally rare (TESLR) species that may occur there.

Hard and Soft Mast Associates. Habitat for these associates will be provided by the restoration and maintenance of the open woodlands, regenerating forests and existing shrublands that produce a mixture of hard and soft mast.

High Elevation Coniferous, Deciduous and/or Mixed Forest Associates. The forested environment at high elevations (>3,000 feet) will be managed to include all successional stages. Spruce restoration may include planting red spruce seedlings, removing exotic tree plantations, and releasing red spruce from a hardwood overstory.

Lepidopterans. Specific butterflies and moths in this species group are limited in occurrence on the GWNF and may be especially sensitive to the direct effects of fire. Care should be taken on prescribing the season, size, and intensity whenever fire is used in areas where they are known to occur. There are no direct key characteristics for this group; however monitoring of habitat and/or populations can determine if negative impacts are occurring. When developing prescribed burn plans, the following should be considered at a minimum for all species in this group:

- Is any species from this group present or potentially present in the project area?
- Is habitat for the species present in the project area?
- What are the negative & positive effects of fire to the species and habitat?
- What mitigation can be performed to reduce impacts to species, i.e. burning during specific part of life-cycle (hibernation, non-breeding, dormancy, etc.); protecting individuals from direct effects of fire; protecting duff layer in mesic areas; etc.?
- Are there sufficient populations of this species adjacent to the project area to re-populate after the project?
- Are there any additional habitat management techniques that can be used to reduce impacts such as mechanical thinning or removal of vegetation?

Consideration of, and mitigation for, these questions should provide for species in this group.

Species Needing Occurrence Protection. These species are rare in occurrence across the forest and known populations should be protected. Implement the Species Occurrence standards to protect these species.

Open Area Associates. All types of openings are important and existing grasslands and shrublands of all sizes should be maintained. For some species it is key to maintain openings of a given size (greater than 40 acres or greater than 100 acres). Moving towards the desired open woodland component of the Oak Forest and Woodland and Pine Forest and Woodland ecological systems will produce open woodlands of a variety of sizes, including those greater than 100 acres in size. Meeting the regenerating forest objectives and objectives for openings at high elevations are also essential for this group. It is also beneficial that these open conditions be incorporated within a forested environment. Many species, particularly bird species, need a combination of closed canopy and open canopy conditions during various parts of their life cycle.

Ruderal Associates. These species require the continued management of the open character of old home sites, roadsides, old fields where these species are found.

Sandstone Glade and Barren Associates. Establish Special Biological Areas for areas that represent high quality examples of this habitat.

Species Sensitive to Over-Collection. The strategy for these species is to continue to educate the public on species needs, restrict access to known populations, and limit approval of collections of these species to permitted scientific purposes only.

Species Sensitive to Recreation Traffic. The species on this list currently occur outside of Special Biological Areas, rare, and wetland communities. There are no ecosystem diversity plan components which cover these species. The strategy for these species is to continue to educate the public on species needs, restrict access to rare or sensitive populations (this may include road or trail relocation, Forest Supervisor closure orders, barriers, and other means), and implement standards to protect these species where they occur during projects that involve heavy equipment or ground disturbance. New roads and trails should be located to avoid populations of these species and existing roads and trails should be evaluated for closure if they are causing declines to populations. Many roads on the Forest are not under our control, so partnerships and collaborative efforts may be required to help sustain species in this group.

Other Species. The habitat needs of the following two species could not be fully met through the ecological system direction or the direction for the species groups. These two species are dependent upon both riparian systems and terrestrial systems. Specific direction for each species is added to address their needs that are not met through species groups or ecological system direction.

Tiger Salamander. New Special Biological Areas are created to protect the newly found eastern tiger salamander populations. This includes habitat management between all the ponds to allow for long-range dispersal, including mature forest and low stem densities. It is recognized that local amphibian population persistence requires sufficient terrestrial habitat, the maintenance of habitat quality, and connectivity among local populations.

Wood Turtle. In watersheds with known populations of wood turtles: 1) Maintain or create openings in riparian areas for turtle foraging and thermoregulation; 2) Manage and protect known existing nest sites; 3) Create additional suitable nest sites where appropriate; 4) Maintain or create instream woody debris; 5) Minimize sediment, pollutant, and pesticide loading to stream channels; 6) Avoid channelizing streams, impounding streams, and stabilizing streambanks with over-hanging vegetation; 7) Allow beaver activities that create suitable habitat; 8) Identify hibernacula with significant turtle concentrations and/or other areas where there is a high potential for human interaction with wood turtles; 9) Evaluate the need for seasonal restrictions on road use or other activities (such as in stream activities) to protect the turtle; and 10) Mowing decks will be raised a minimum of 8 inches above the ground when mowing near streams. Within the Paddy Run watershed, including Vance's Cove: 1) manage road use to reduce vehicular traffic

during times of the year when turtles are most active, especially during nesting season; 2) create and/or maintain openings with a mixture of grass, forbs and shrubs in the riparian corridor for turtle foraging areas; 3) avoid or mitigate disturbance from vegetation management activities near streams and seeps during times when the turtles are active; 4) create nest sites away from roads and trails; 5) place LWD and rootwads into the stream channel to provide over-wintering habitat; and 6) identify opportunities to reduce human-turtle interactions. See Final EIS Appendix G (Section 3.5) for additional details on these management strategies for the wood turtle.

Old farm tracts and those areas managed in Management Prescription Area 7G - Pastoral Landscapes provide important habitat for many species. This habitat includes open grasslands, shrublands, and riparian forests. Grazing allotments, special uses for hay production, and mowing are all appropriate tools to maintain these habitat conditions. Management of these areas, the appropriate tools to use, and the desired mix of open areas and riparian forests will be evaluated during implementation of the Plan.

Objectives for Species Diversity

OBJ SPD-1: Maintain and enhance old fields, short/medium/tall grasslands at old farm tracts at Hidden Valley, Evans Tract, Wallace Tract, Marshall Tract, Whitting Tract, Cullers Tract Moody Tract, and Zepp Tannery. Maintain some of these areas in tracts 100 acres or larger in size.

OBJ SPD-2: Maintain at least 2,700 acres of grassland habitat. Maintain all current areas that are greater than 40 acres in size in patches at least that size, or greater. Maintain all current areas that are greater than 100 acres in size in patches at least that size.

OBJ SPD-3: Maintain at least 1,500 acres of shrubland habitat.

OBJ SPD-4: Approximately 18,000 to 30,000 acres of forest will be in the 0-10 year age class from regeneration harvest at the end of the first decade.

OBJ SPD-5: Restore and maintain 12,000 acres to 20,000 acres of forest in open woodland conditions through the use of wildland fire on an annual basis.

OBJ SPD-6: Create or maintain grasslands, shrublands or regenerating forests on approximately 1,000 acres at elevations greater than 3,000 feet on a decadal basis.

OBJ SPD-7: Maintain or create old fields or clusters of maintained openings on sites greater than 2,000 feet elevation on at least fifteen sites around the forest.

OBJ SPD-8: Maintain a stable and/or increasing population trend for the Indiana bat through protection and proactive management of Indiana Bat Primary and Secondary Conservation Areas. (See Management Prescription Area 8E4)

OBJ SPD-9: Maintain a stable and/or increasing population trend for the Cow Knob salamander over the planning period through protection and maintenance of the Cow Knob Salamander Habitat Conservation Area. (See Management Prescription Area 8E7)

OBJ SPD-10: Maintain or increase populations/occurrences of northeastern bulrush, swamp pink, Virginia sneezeweed, shale barren rockcress, and smooth coneflower through protection and maintenance of existing sites. (See Management Prescription Area 4D)

OBJ SPD-11: Maintain stable and/or increasing population trends for all Management Indicator Species.

OBJ SPD-12: Maintain about 400-600 acres of wildlife grassland openings through mechanical means, maintain wildlife improvements through burning on about 800 acres, improve conditions on about 100-200 acres of wildlife openings and old fields, and create about 20-30 acres of new temporary openings per year to meet structural diversity needs for migratory birds and other species.

OBJ SPD-13: Manage 900-1,500 acres of early successional habitat per decade using practices designed to emphasize habitat for ruffed grouse and American woodcock.

OBJ SPD-14: Existing grazing allotment plans will be revised over the next 10 years to address habitat conditions.

NON-NATIVE AND NATIVE INVASIVE SPECIES

Management Approach

Management of all non-native invasive species will focus on four components: 1) prevention of new infestations; 2) elimination of new infestations before they become established; 3) containment or reduction of established infestations; and 4) reclamation of native habitats and ecosystems. Integrated pest management approaches will be used in all four of these components. Monitoring of new and existing infestations is an important part of the monitoring strategy (Chapter 5). Since non-native invasive species are a problem on all lands, a key component of the management strategy is coordination and cooperation with other federal, state, and local agencies and local interest groups. The Forest will contribute, whenever possible, to research aimed at suppression of hemlock woolly adelgid, beech bark disease, dogwood anthracnose and other introduced significant non-native invasive pest problems. The GWNF will actively participate with other groups in developing and implementing control strategies. Education of forest users, particularly in high use areas will be another component of the management strategy.

Non-Native Invasive Plants (NNIP). Given the current known distribution of non-native invasive plants (NNIP) on the George Washington National Forest, there is a need to implement an integrated program of NNIP control to protect forest resources and reduce the potential to spread from Forest lands to adjacent private or public lands. New infestations and new NNIP species are likely to occur during the life of the Plan but a list of priority species for treatment will be maintained on the Forest. Prevention of new infestations is important, as is control of existing infestations. Before management activities take place it is important to identify potential NNIP threats and develop a control/eradication plan that includes follow up monitoring of any NNIP treatments for effectiveness. High priority treatment areas for NNIP are:

- Locations with threatened, endangered or sensitive plant species;
- Special Biological Areas/rare communities
- Research Natural Areas
- Hot spots of NNIP infestation
- Infestations of new NNIP species
- Areas disturbed by fire, insect, disease or storm damage
- Designated Wilderness
- Recommended Wilderness Study Areas
- Roadsides and parking areas
- Trails and trailheads
- Riparian areas
- Wildlife openings
- Other disturbed areas

Gypsy Moth (*Lymantria dispar* (L.)) is a non-native insect defoliator that favors many deciduous tree species, primarily oak. The abundance of oak species throughout the forest makes the George Washington National Forest prime habitat for the gypsy moth. The mature and overmature state of these oak forests over a vast majority of the Forest results in high probabilities of severe mortality and loss of hard mast production over time. Gypsy moth suppression priorities are**:**

- Where threatened, endangered, proposed, or sensitive species or their habitats may be negatively impacted by the gypsy moth;
- Rare communities likely to be severely affected by gypsy moth if no action is taken;
- Developed recreation areas and other concentrated use areas;
- Areas of high site productivity to maintain stump sprouting capability for oak regeneration in the short-term, resulting in long-term maintenance of hard mast production and forest diversity;
- Scenic byways and viewsheds; and
- Old growth forest communities.

Hemlock Woolly Adelgid (*Adelges tsugae*) is a non-native aphid-like insect that infests hemlock trees. The insect feeds on the sap of the tree at the base of the hemlock needles. Infested trees decline over a few years and eventually die. Most of the Forest is generally infested and severe mortality has already occurred in most of the hemlock stands found predominantly along our creeks and streams on the GWNF. Although there is little to do to prevent further mortality, opportunities to mitigate the loss of the hemlocks in the riparian ecological system will be explored.

Emerald Ash Borer (*Agrilus planipennis*) is a non-native borer that attacks ash species. This recently introduced pest is not yet known to occur on the Forest; however, it has been identified in other areas of Virginia and West Virginia. The insect can cause severe mortality of ash. Although this Forest does not have a large ash component, this insect pest is still of great management concern due to uncertainty of the extent of mortality this pest could cause (e.g. elimination of all ash from our ecosystems).

White-Nose Syndrome (WNS). WNS is a fungus caused disease that was first seen in New York caves during the winter of 2006-2007. The newly discovered, cold-loving fungus (*Geomyces destructans*) has spread south during the past several years and was first confirmed in Virginia and West Virginia during the winter of 2008-2009 with additional spread and caves contaminated in 2009-2010. To date well over one million bats have been killed by this fungus which irritates bats during hibernation causing them to wake and use precious fat reserves. The bats then starve and or freeze when they attempt to fly and leave the cave in search of food during the midst of winter conditions. Important caves used as hibernacula by endangered bats have been gated and locked. Additionally, all caves and mines on the Forest are currently closed per Regional Forest order to halt human disturbance of bats and prevent spread of fungal spores on clothing, boots, and equipment.

Southern Pine Beetle (*Dendroctonus frontalis*) is a native bark boring insect that attacks primarily yellow pines (shortleaf, pitch, table mountain, and Virginia pines on this Forest). However, it can also infest white pine and even red spruce. Although a native insect, populations can reach outbreak proportions causing undesirable widespread mortality in pine ecosystems. Priorities for reducing or eliminating potential losses from Southern pine beetle are**:**

- Where threatened, endangered, proposed, or sensitive species or their habitats may be negatively impacted by the Southern pine beetle;
- Rare communities likely to be severely affected by Southern pine beetle if no action is taken;
- Potential spread onto adjacent landownerships;
- Developed recreation areas and other concentrated use areas;
- Scenic byways and viewsheds; and
- In pine stands adjacent to Wilderness, where spot spread from Wilderness is possible.

Didymo (*Didymosphenia geminata*) is a freshwater diatom (type of alga) that can form massive blooms on the bottoms of streams and rivers where it attaches itself to the streambed by stalks. These stalks can form a thick brown mat that covers rocks, submerged plants and other materials. The GWNF will actively participate with other groups in developing and implementing control strategies. Education of forest users, particularly in high use areas will be another component of the management strategy.

Objectives for Non-Native and Native Invasive Species

OBJ NNI-1: Survey 5,000 to 10,000 acres for non-native invasive plants annually.

OBJ NNI-2: Treat 2,000 to 5,000 acres of non-native invasive plants annually.

CLIMATE CHANGE

Management Approach

We have historically experienced droughts, flooding, extreme weather events, catastrophic fire, insects and diseases, and to a more gradual degree, movement in the ranges of flora and fauna. Many of our current management strategies already strive to maintain or enhance the health and resiliency of various forest resources to better withstand environmental stresses and human-induced pressures. However, the effects of an accelerated rate of change and an increase in the intensity of these impacts on forest resources and ecosystems are still largely unknown and unpredictable. Climate change effects are multiple, varied, and interact with many other stressors/variables. Therefore, an adaptive management approach that monitors forest resource conditions, and incorporates the current state of scientific knowledge related to responses to climate change, is needed that will allow us to proactively adjust current strategies or adopt new strategies as needed.

Climate change strategies for the George Washington National Forest focus on both adaptation (ways to maintain forest health, diversity, productivity, and resilience under uncertain future conditions) and mitigation (such as carbon sequestration by natural systems, ways to provide renewable energy to reduce fossil fuel consumption, and ways to reduce environmental footprints). These strategies focus on: 1) reducing vulnerability by maintaining and restoring resilient native ecosystems; 2) providing watershed health; 3) providing carbon sinks for sequestration; 4) reducing existing stresses; 5) responding to demands for cleaner energy including renewable or alternative energy; and 6) providing sustainable operations and engaging in partnerships across landscapes and ownerships.

Reduce Vulnerability and Restore Resilient Native Ecosystems. A primary focus of the Forest Plan is an emphasis on ecosystem resiliency that will support ecological systems diversity and species viability now and in the future. Maintaining and restoring healthy ecosystems that can tolerate, or appropriately adapt to, changes in environmental and social conditions are our best strategy for preparing for potential changes from unusual climate variations. Management strategies to maintain and restore resilient native ecosystems include:

- Identify desired conditions and objectives to maintain the resilience and function of nine identified ecological systems and determine the desired disturbance regimes, including fire, for those ecosystems.
- Increase the use of wildland fire as a tool for achieving resource management desired conditions.
- Maintain or restore ecological conditions that are rare on the forest, such as spruce, high elevation early successional habitat, open woodlands, old fields, rare communities, and Special Biological Areas.
- Manage the forest to maintain connections of forested landscapes to facilitate movement of species that may need to move or migrate for populations to remain viable.
- Manage the forest to maintain remote settings in areas identified as high priorities for providing core reserves.
- Identify land acquisition and exchange priorities that include high elevation habitats or connectivity corridors.

Watershed Health. Specific management strategies the George Washington National Forest will use to address the management and conservation of terrestrial and aquatic resources in light of predicted effects from climate change are:

- Protect and restore beaver meadows, wetlands, and floodplains to improve natural water storage, reduce flood hazards, and prolong seasonal flows. Beaver ponds and wetlands recharge groundwater, raise the water table, retain sediment and organic matter, store water during floods and release it slowly, mitigate low flows and drought, reduce carbon turnover rate, raise pH and ANC, while reducing SO^2, Al, and NO^3 .

- Protect and restore riparian forests to moderate changes in stream temperature, maintain stream bank stability, and provide instream habitat, particularly in key native brook trout streams.
- Remove migration barriers and re-establish habitat connectivity so that species can move to more suitable habitat, or move to or from refugia, particularly in systems supporting native brook trout.
- Improve or decommission roads to reduce adverse impacts during large storms to prevent surface erosion and fill slope failure and landslides. Construct stream crossings and bridges to withstand major storm and runoff events.
- Include standards to assess geologic hazards from management activities, including potential landslide hazards and risks, particularly as the population and infrastructure continue to increase in areas adjacent to the Forest.
- Revegetate bare soil as soon as possible. Suspend or eliminate recreation uses that are causing elevated sediment levels to streams or large areas of long-term loss of soil productivity outside the designated use area.
- Riparian corridor widths are expanded and standards included for protecting channeled ephemeral streams.
- Consider nutrient replacement when planning vegetative management and/or look for alternative solutions (such as watershed liming or fertilization) in acid-sensitive watersheds.
- Identify soils highly sensitive to acid deposition and nutrient loss. Do not allow unlimited small diameter utilization in those areas and consider possible soil fertilization treatments.
- Relocate, close or decommission roads causing significant resource damage.

Carbon Sequestration. National Forest System lands have opportunities for 1) biomass sequestration and storage of CO_2, and 2) geologic sequestration and storage of CO_2.

Biomass sequestration: Sustainable forestry practices can increase the ability of forests to sequester atmospheric carbon while enhancing other ecosystem services, such as improved soil and water quality. Planting new trees and improving forest health through thinning and prescribed burning are some of the ways to increase forest carbon in the long run. The most defensible options for managing forests for their carbon storage are keeping forests as forests, reforesting areas where forests historically occurred, using forest biomass to offset fossil-fuel use (burning forest biomass generally means that fossil fuel will not be burned), and promoting long-lived forest products such as wood-framed buildings. Forests (particularly older forests) generally store carbon better than forest products, so harvesting old-growth forests for their forest products is not an effective carbon conservation strategy (Harmon et al. 1990). However, harvest and regeneration of young to middle-aged forests for long-lived forest products can help with carbon storage (Ryan 2008). The Plan provides for a diversity of ages and structure in the forest to provide multiple strategies for addressing carbon storage.

Geologic Sequestration: In May 2009, the U.S. Department of Energy released a comprehensive study of geologic carbon sequestration and storage (CSS) on federal lands in "Storage of Captured Carbon Dioxide Beneath Federal Lands", (National Energy Technology Laboratory, 2009). This report characterizes and estimates the geologic storage potential as well as regulatory issues on all federal lands. The FS and BLM are the two agencies with the lion's share of opportunity for geologic CSS. At the current time, it is not possible to assess what role geologic CCS may play on federal land. However, an adaptive management approach may evaluate this opportunity in the future.

Existing Stresses. An early detection and response strategy associated with non-native invasive species will be critical to limit new introductions. Aggressive treatment of established invasive species, along with the control of insects and diseases, are likely to become more critical to maintaining desired conditions for healthy forests under a changing climate. Due to fragmented land ownership patterns, success in reducing invasive species will often require going beyond Forest boundaries, and continued work with partners will be needed. In addition, management practices (such as thinning and age class diversity) that sustain healthy forests and provide adequate nutrients, soil productivity, and hydrologic function promote resilience and reduce opportunities for disturbance and damage. Management strategies for mitigating existing stresses are:

- Southern pine beetle infestations should be quickly addressed. Silvicultural options for decreasing the vulnerability of attack could include thinning and/or low intensity fire to lower basal areas.
- Aggressive treatment of highly invasive non-native invasive plant and animal species.

Alternative Energy Demands. Environmental effects of wind energy development, such as impacts to bats and birds and visual quality, have not been evaluated on the Forest. The Forest Plan has identified areas where wind development would not be compatible with management of other resources. There are opportunities to evaluate potential wind development on some suitable ridges of the GWNF. Evaluation of wind development will occur on a project-specific basis after a specific request is submitted to the Forest.

Sustainable Operations and Partnerships. The Forest will work with the state of Virginia to incorporate the data on greenhouse gas emissions from our management activities into a State inventory, just as we have done with the fine particulates inventory. The Forest will continue striving to reduce its environmental footprint and decrease the greenhouse gases emitted through day-to-day operations, including the use of more fuel-efficient vehicles, reducing the number of miles driven and making facilities more energy-efficient. The Forest will also continue working with partners, including other federal agencies, State and local governments, non-governmental organizations and other stakeholders to be more effective in efforts to adapt lands, ecosystems, and species to climate change. Examples are The Nature Conservancy in the Fire Learning Network and the Potomac Watershed Partnership, Appalachian Mountains Joint Venture, Eastern Brook Trout Joint Venture, and USFWS Landscape Conservation Cooperatives Initiative.

RESTORATION

Management Approach

Restoration has already been discussed under several other sections. Restoration activities expected to occur include:

- Maintaining connections of forested landscapes.
- Improving connectivity of stream systems through replacement of standard culverts with crossing structures that allow for full passage of all aquatic organisms.
- Controlling sources of erosion and sedimentation and restoring stream channels to fully functional levels.
- Road decommissioning in areas where roads are causing unacceptable resource damage.
- Encouraging active populations of beaver to facilitate wetland creation.
- Planting American chestnut seedlings in partnership with several chestnut organizations.
- Managing fire to restore fire-dependent pines like table mountain pine and shortleaf pine.
- Expanding the Spruce Forest ecological system to its full extent in the Laurel Fork area.
- Creating and maintaining high elevation grasslands and old fields.
- Using fire and timber harvest to restore vegetation composition and structure, particularly in the Pine Forest and Oak Forest and Woodland systems.
- Controlling the introduction and spread of non-native invasive species.
- Improving wetlands through removing drainage structures and ditches in old agricultural lands.
- Enhancing bottomland hardwoods in the few major floodplains on the GWNF.
- Retention of riparian buffers in the riparian corridor.
- Maintaining and improving habitat for mussels.
- Maintaining and improving habitat for rare community species.
- Maintaining the processes that allow for oak reproduction.
- Managing for warm season grasslands.
- Converting pine plantations to native pines and hardwoods.
- Closing abandoned mine lands and restoring native vegetation.
- Identifying priority watersheds for focusing restoration needs.
- Liming of streams that have high acidity levels.

FIRE

Management Approach

Wildland fires are categorized into two distinct types of fire: 1) wildfires are unplanned ignitions or prescribed fires that are declared wildfires; 2) prescribed fires are planned ignitions. Wildfires are managed according to the Federal Wildland Fire Management Policy (latest is February 2009). Our strategy for responding to wildfires is based on the ecological, social, and legal consequences of the fire. The circumstances under which the fire occurs and the likely effects on firefighter and public safety dictate the appropriate management response. All unplanned wildfires are assessed and managed following processes like the Wildland Fire Decision Support System (WFDSS) process that examines the appropriate range of responses.

The number of acres treated each year by prescribed burning varies based on factors such as weather conditions, fuel conditions, budget, and available resources (staffing). Changes in any of these factors or unexpected events can sometimes dramatically affect the acreage burned forestwide from year to year. Based on anticipated funding levels and capacity, it is projected that approximately 12,000 – 20,000 acres will likely be prescribed burned annually across the GWNF, with increases in the number of acres burned possible with favorable weather conditions, additional agency capacity, or opportunities for joint efforts with State programs, partners, or other cooperative opportunities such as the Fire Learning Network. When these opportunities occur, our strategy is to take advantage of these occasions to accelerate ecosystem restoration and make improvements toward desired conditions.

Conditions for managing fire can be unpredictable; however, where necessary to control erosion, we will generally install water diversions on firelines during their construction and revegetate firelines after suppression.

Timber, ecological, wildlife and prescribed fire objectives will be closely coordinated. For example, it may be undesirable to burn regenerated areas when the desired residual tree species cannot withstand the effects of fire with minimal degradation. Areas should not undergo prescribed burning for at least 30 days after herbicide treatment.

Objectives for Fire

OBJ FRE-1: Where fire regimes have been moderately (Condition Class 2) or significantly (Condition Class 3) altered from their historic range, 120,000 to 200,000 acres per decade are prescribed burned to move these acres toward a Condition Class 1. Fire regimes in Fire Condition Class 1 areas are within historical ranges.

OBJ FRE-2: To increase or maintain structural diversity in Oak Forests and Woodlands and Pine Forests and Woodlands, 12,000 to 20,000 acres of prescribed burning annually are implemented.

OBJ FRE-3: Demonstrate conformity with the State Implementation Plan for any prescribed fire planned within EPA-designated “non-attainment” and “maintenance” areas.

OBJ FRE-4: Protection of firefighter and public safety is the most important objective during wildland fire management activities. Once firefighters have been assigned to a wildland fire, their safety becomes the highest value to be protected.

RECREATION

Management Approach

The Forest’s primary emphasis for the developed recreation program on the GWNF is to continue providing the full spectrum of opportunities, ranging from minimally to highly developed facilities in a financially and environmentally sustainable manner.

During the initial years of this plan, the focus will be on utilizing a collaborative approach to plan and implement an alignment of recreation facilities/services with demand and financial and environmental sustainability. A key part of this strategy will be to seek long-term funding and establish additional partnerships to reduce facility maintenance backlogs and add desired facilities that meet increasing recreation demands.

A similar management strategy is anticipated for dispersed recreation. The focus will be on improving trail conditions and long-term sustainability. Much of the focus on trails is expected to target high-use areas near population centers. This work is expected to emphasize bringing existing trails up to sustainable standards through redesign and reconstruction as necessary. New trail construction will be evaluated as opportunities arise, with emphasis on loop trails. The possibilities of utilizing decommissioned roads for trails will be examined. Programs for achieving technically challenging trail maintenance, resources protection, user education, and various inventory and monitoring activities will be achieved primarily through partnerships with various organizations, such as the Appalachian Trail Conservancy, Appalachian Trail clubs, universities and others, to the extent funding allows. Proposals for new trails, trail expansions, or projects that would change the maintenance level or design use of existing trails, or that include installing a new or replacing an existing trail bridge, would be reviewed using a process such as or similar to the national forest's Excellence by Design process.

Where information boards are provided at trailheads used to access backcountry areas, priority consideration is given to appropriate orientation, resource protection and public safety messages. Examples include but are not limited to a trail(s) map, address and/or latitude and longitude for the trailhead, phone numbers and locations for nearest law enforcement agency and emergency medical services, Leave No Trace principles, group size limits (where applicable), Safety Tips, Camping in Bear Country, Hazard Trees and similar messages.

The mileage of roads maintained for high clearance vehicles (OHV) is estimated to be about 1,000 miles across the Forest, near current levels.

A majority of the areas that provide Semi-primitive Non-Motorized (SPNM) recreation opportunities will be maintained by the use of management prescription areas that restrict road construction and timber harvest. These prescription areas are allocated to 85 – 90% of the currently inventoried SPNM areas.

For Semi-Primitive Motorized (SPM) areas, the objective is to maintain at least 85% of the inventoried areas as SPM. New permanent road construction within semi-primitive motorized areas will generally be limited to roads that are closed after the immediate resource access need is met. Road restoration and maintenance is generally limited to that necessary to protect soil, water, and biological resources. Road restoration is done in such a manner as to maintain the unimproved nature of the road. Temporary road construction within semi-primitive motorized and non-motorized areas is allowed since temporary roads are closed and revegetated following the use.

Objectives for Recreation

OBJ REC-1: Provide approximately 170,000 - 200,000 acres of Semi-Primitive Non-Motorized (SPNM), 180,000 – 210,000 acres of Semi-Primitive Motorized (SPM), and 650,000 – 710,000 acres of Roaded Natural (RN) recreational opportunities across the Forest.

OBJ REC-2: Provide approximately 1,000 to 1,100 miles of non-motorized trails. Manage the extent, location, and level of cooperative maintenance of system trails to improve sustainability and avoid any net increase in trail maintenance costs.

OBJ REC-3: Provide a total of 60-75 miles of motorized trail within the Management Prescription Area 7C (All-Terrain Vehicle Use Areas).

OBJ REC-4: For the Appalachian National Scenic Trail, the remaining Priority 1 and 2 tracts are acquired over the next decade.

OBJ REC-5: Agreements for Voluntary Services are in place and up-to-date for all sponsored groups and individual volunteers, including but not limited to trail maintaining organizations, campground hosts, interpreters, photographers, visitor use surveyors, etc. For sponsored volunteer groups, the agreements

include an annual program of work which will be reviewed by staff specialists to prevent conflicts with other resources.

OBJ REC-6: Provide at least 244 miles of open or seasonally open roads as high clearance roads which will emphasize scenic touring by off highway vehicles.

LANDSCAPE AND SCENERY

Management Approach

The Scenery Treatment Guide for the Southern Region (issued April 23, 2008) and the scenic integrity objectives (SIO) within the standards of the Plan will provide guidance for mitigating scenery impacts for management activities and should be incorporated into project planning and implementation.

Table 3-2. Relationship between New Scenery Management System (SMS) and Old Visual Management System (VMS)

SMS-Scenic Integrity Objective	Appearance	VMS-Visual Quality Objective
Very High	Unaltered	Preservation
High	Appears Unaltered	Retention
Moderate	Slightly Altered	Partial Retention
Low	Moderately Altered	Modification

The following guidelines in Table 3-3 offer a listing of management activities and various treatment clauses for use in meeting the desired conditions for scenery. The listing of management treatments and management activities is not all-inclusive. There are additional treatments provided as forestwide standards in Chapter 4–Design Criteria. The treatment guidelines should not be used to automatically determine which treatments should be applied. Each project may have unique conditions that need to be considered.

Table 3-3. Scenery Treatment Guide

Activity	Scenic Integrity Objective		
	High	Moderate	Low
Clearcut or Overstory Removal	N/A	B,C,D,F,G,H,M,N,U,V,X	L,O,U,V
Shelterwood	A,B,C,D,F,G,H,J,M,N,P,U,V	A,B,C,D,F,H,M,N,P,U,V,Y	B,L,M,P,U,V
Shelterwood with Reserves	A,B,C,D,F,G,H,J,M,N,U,V	A,B,C,D,F,H,M,N,U,V,Y	B,L,M,U,V
Salvage	A,B,C,D,F,G,H,K,U,V	A,B,C,D,F,H,U,V,Y	B,L,U,V
Uneven-age System	A,B,C,D,F,G,H,I	A,B,C,D,F,G,H,I	I
Any Thinning	A,B,C,D,F,G,H	A,B,C,D,F,G,H	A,B
Maintaining Roadsides	A,B,E,G,S,T,W	A,B,E,S,T,W	A,E,S,T,W
Road Construction or Reconstruction	C,G,H,S,T,W	A,B,C,H,S,T,W	A,B,S,T,W
Temporary Road Construction	C,G,H,S,T,W	A,B,C,G,H,S,T,W	A,B,S,T,W
Utility or Energy Corridor Construction	A,B,C,D,E,G,H,Q,R	A,B,C,D,E,H,Q,R	B,H,Q,R
Prescribed Fire	G, Z, AA, AB, AC, AD	G, Z, AA, AB, AC, AD	G, AB, AC, AD
Utilities (electricity, gas, phone, water, sewer)	AE, AF, AG, AH	AE, AF, AG, AH	

A. Trees should be selectively removed to improve scenery within high use areas, vista points, and along interpretive trails.
B. Flowering and other visually attractive trees and understory shrubs should be favored when leaving vegetation.
C. During temporary or permanent road construction, eliminate or remove from view, slash and root wads as viewed from the immediate foreground of High and Moderate SIO viewing platforms to the extent possible. Some slash may be aligned parallel to roads at the base of fill slopes to collect silt.
D. Slash should be removed, burned, chipped or lopped to within an average of 2 feet of ground, when visible within 100-foot zone of concern level 1 and 2 travelways and use areas.
E. Stems should be cut to within 6 inches of the ground when doing roadside maintenance or at utility crossings.
F. Leave tree or unit marking should be applied so as to not be visible within 100 feet of concern level 1 and 2 viewing platforms*.
G. Scheduling work outside of major recreation seasons should be considered on roads leading to recreation facilities.
H. Special road and landing design should be used. When possible, log landings, roads and bladed skid trails should be located out of view to avoid bare mineral soil observation from concern level 2 viewing platforms*. (See also forestwide standards in Chapter 4 that address road, skid trail and landing design in concern level 1 travel routes.)
I. An opening size should generally not exceed 1.5 acres.
J. An actual opening size up to 10 acres could occur in the foreground zone and 25 acres in middleground and background zone visible from concern level 1 & 2 viewing platforms.
K. An actual opening size up to 25 acres with inclusions could occur.
L. An actual opening size up to 40 acres with inclusions could occur.
M. Along concern level 1 and 2 travel routes, openings should be spaced at a minimum of 1000 feet apart next to the travel route.
N. Along concern level 1 and 2 travel routes with a high SIO, openings of up to 200 feet could occur.
O. Along concern level 2 travel routes with a moderate SIO, openings of up to 400 feet could occur.

P. Removal of overstory should be delayed until understory is 10 feet in height.
Q. Utility rights-of-ways should be located to conform to natural patterns of vegetation.
R. Overhead utility lines and support towers should be screened where possible.
S. The visual impression of roads should be blended so that they remain subordinate to the existing landscape character in size, form, line, color, and texture.
T. Gravel pits and borrow areas should be excluded from seen area of visually sensitive travelways and viewing points.
U. No adjacent regeneration cutting should occur until dominant and codominant species reach 20 percent of height of tallest adjacent stands for even-aged timber harvest cutting methods.
V. Openings should be shaped and oriented to contours and existing vegetation patterns to blend with existing landscape characteristics. Edges should be shaped and/or feathered where appropriate. No geometric shapes should be used.
W. Cut and fill slopes should be revegetated.
X. An actual opening size up to 10 acres could occur in the near foreground zone (within approximately 1,000' of viewing platform*), 25 acres in remainder of foreground zone (approximately 1,000' to ½ mile), and 40 acres in middleground and background zone as viewed from concern level 1 & 2 viewing platforms*.
Y. An actual opening size up to 40 acres could occur.
Z. For areas visible in the Foreground and Middleground Zones from Sensitivity Level 1 and Level 2 viewing platform(s)*, there should be visual diversity and visual links to surrounding forested landscape (mosaic of openings) following the use of prescribed fire.
AA. For areas visible in the Foreground Zone (up to ½ mile) from Sensitivity Level 1 viewing platforms*, and the immediate Foreground (300 feet) from Sensitivity Level 2 viewing platforms, the perimeter of the burned area should appear random and natural, not controlled. Visual impacts of constructed line would be mitigated.
AB. For areas visible in the immediate Foreground Zone (300 feet) from Sensitivity Level 1 and 2 viewing platforms*, minimize permanent scarring or damage to important scenic features.
AC. Protect recreation infrastructure including minor constructed features (like trail signs, information boards, etc.) from scarring and damage.
AD. Minimize the visual impact of linear corridors created by fire lines.
AE. Crossing of forest roads and trails by utility corridors should be at right angles whenever possible. Structures associated with the utility should be set as far back from the crossing as possible. To minimize the duration of view by users of the forest road or trail, the utility corridor and its structures should be screened by vegetation to the maximum extent feasible.
AF. Structures, cables, wires, pipes and other materials associated with utilities that will be above ground should be non-reflective and treated or painted to blend with the natural environment to the fullest extent possible.
AG. Utilities should be co-located whenever possible to reduce visual impacts.
AH. Follow natural topographic lines to reduce the visual impact of structures, soil disturbance and vegetation removal. Consider an alignment that locates utilities behind landforms when otherwise visible from sensitivity level 1 and 2 viewing platforms*. Consider an alignment that locates utilities low enough along natural topographic lines that their structures do not visually break into the skyline when viewed from sensitivity level 1 and 2 viewing platforms.

*Viewing platforms are areas where people routinely view landscapes. They include but may not be limited to roads, roadside pullouts, parking areas, trails, rivers, lakes, developed recreation sites, known dispersed campsites, visitor centers, and residential areas. Due to intervening landforms, rock outcrops, and vegetation, not all of the landscape within the foreground, middleground and background distance zones is visible.

Objectives for Scenery

OBJ SCE-1: Manage the George Washington National Forest with the following Scenic Integrity Objectives (acres are approximate): Very High 45,000 acres; High 424,000 acres; Moderate 579,000 acres; and Low 17,000 acres.

CULTURAL RESOURCES

Management Approach

Significant cultural resources are protected from loss. Our overall strategy for sustaining the cultural resources, which are a desirable part of the setting and character of the GWNF, involves continuing to identify significant sites and stabilizing them, taking appropriate measures and employing current treatments needed to protect them from damage, and preserving them for future scientific research and interpretation opportunities. Surveys are conducted prior to site disturbance activities. Visitors have opportunities to learn about the past and how to protect cultural resources through on and off-site interpretation and hands-on programs such as Passport in Time. Partnerships and agreements with State Historic Preservation Offices and universities play an important role in helping to achieve desired conditions.

Cultural resources are managed through a process of identification, evaluation, and allocation to appropriate management categories (preservation, enhancement, scientific investigation, or release from management under the National Historic Preservation Act) that protect cultural resource values and benefit the public. A Heritage Program Plan for the George Washington National Forest is complete and implemented. Historic Property Plans are completed and implemented for highly significant cultural sites, particularly Priority Heritage Assets.

ROADS, ACCESS AND FACILITIES

Management Approach

The main priorities for managing the roads and facilities that make up the GWNF infrastructure are on safety and maintenance of existing systems. This includes backlogged repairs and upgrades; improvements for environmental protection; disposal of facilities that are no longer needed or that are not financially or environmentally sustainable; and rehabilitation of user-created trails, roads and parking areas. Infrastructure additions are anticipated to be limited and dependent on funding availability.

The road system needed to manage the GWNF has been identified through the Transportation Analysis Process (TAP). While new roads will be needed for future access to manage the Forest, there will be a net decrease in the road mileage over the next ten to fifteen years. Decisions on roads to be decommissioned will be made on a project-level basis based on appropriate site-specific environmental analysis and disclosure to assure compliance with the NEPA. These decisions will be based on the need for the road to meet resource and recreation objectives and the environmental risks of maintaining the road (including the location of the road in priority watersheds).

Maintenance priorities for roads will include bridge safety, adequate signs, suitable stream crossings, and any resurfacing or reconstruction needed to provide an overall road system that is useable and safe for motorized vehicle use. Unauthorized travelways will either be decommissioned or left to naturally re-vegetate.

The facilities program includes construction and maintenance of a variety of structures and associated utilities across the Forest that are used for recreation, administration, maintenance, storage, and other general management purposes. Program priorities for the future will be directed toward: (1) reducing the backlog of facility deferred maintenance, particularly those items associated with health and safety; (2) right-sizing the facility inventory to match current management needs, including decommissioning and disposing of those facilities which are no longer required to support management or recreation objectives or that are not financially or environmentally sustainable; (3) reducing the operating and maintenance costs associated with the facility portfolio; and (4) providing limited new facilities to support priority programs and areas.

New facility construction in the future is expected to be limited to improvements and expansions of existing facilities. Compliance with applicable accessibility requirements will continue to be a priority.

Objectives for Roads, Access and Facilities

OBJ RDS-1: No net increase in the current miles of open roads on the forest.

OBJ RDS-2: Over the next 10 years, 100 to 200 miles of roads (classified and unauthorized) are decommissioned. Priorities for decommissioning are roads causing resource damage and roads in priority watersheds.

OBJ RDS-3: Maintain to standard a minimum of 75 miles of passenger car roads (OML 3-5) and a minimum of 105 miles of high clearance vehicle (OML 1-2) roads on an annual basis.

OBJ RDS-4: Conduct condition surveys on at least 25% of passenger car roads (OML 3-5) per year. Annually survey a representative sample of high clearance vehicle roads (OML 1-2) to provide for a forestwide indication of OML 1-2 road conditions.

OBJ RDS-5: Over the next decade, turn over a portion of the 107 miles of forest development roads where the majority of traffic is not related to Forest use to the State Department of Transportation.

LANDS AND SPECIAL USES

Management Approach

The lands and special uses program manages the real estate-related activities associated with GWNF lands. The overall direction for the program is on consolidating these lands through acquisitions and exchanges while providing appropriate access to Federal property for public services and other special uses. For land ownership adjustments, this typically focuses on land parcels within or adjacent to Forest Service boundaries; however, isolated tracts that have special values or contribute to the mission of the Forest Service are also included in our goals.

Following the early land acquisition period during the mid-1930s to early 1940s when the bulk of lands for the GWNF were purchased, the land adjustment program has historically been pursued as a small scale program of tract-by-tract land acquisition and disposal actions to improve consolidation of land ownership. Due to the occasional nature of land acquisition opportunities, it is difficult to predict likely land ownership adjustments in future years, but a generally low level of program activity is expected to continue into the near term. Main concerns for consolidating and expanding land holdings include acquiring high-value ecosystems, threatened, endangered and sensitive species habitat, critical water corridors, and desirable adjoining or private inholdings.

Our program strategy for continued land ownership adjustments is to give priority to the following situations:

- Priority tracts for the Appalachian National Scenic Trail.
- Tracts which help consolidate large blocks of existing Forest lands (as opposed to adding onto small or isolated blocks).
- Acquisitions that protect resource values on adjacent Forest land.
- Acquisitions that contribute to the recovery of threatened, endangered or sensitive species or will aid in the protection of diverse species.
- Lands that enhance recreation, public access, and protection of aesthetic values, especially those that provide public access to waterways.
- Lands that are needed for the protection of important cultural resources.
- Acquisitions that will compliment a designated area such as a Wilderness.
- Lands needed for new administrative or recreational sites and/or protection of existing improvements.
- Other environmentally sensitive lands such as tracts containing unusual geographic features, wetlands or floodplains, rare plant or animal communities, or other attributes of uncommon or striking character.

New land acquisitions should generally be managed according to the adjacent or surrounding area's Forest Plan direction.

Special use authorizations provide for those private uses of Forest lands that are necessary to serve the public interest and which cannot be accommodated on non-Federal land. This includes Forest lands used for utility corridors and transmission lines, communication sites, military training activities, and special events. Our management approach for maintaining desired conditions on the GWNF is to continue to include and enforce appropriate environmental protection controls in leases, easements, right-of-way grants, licenses, and other special use permits. Special uses should be located where they minimize the need for additional designated sites and best serve their intended purpose. Co-locating special uses on land is preferred, when feasible.

Objective for Land and Special Uses

OBJ LAN-1: Survey and maintain to standard about 100-150 miles per year of boundary lines.

TIMBER MANAGEMENT

Management Approach

The timber sale program and commercial timber sales are used as a valuable tool to achieve other multiple resource objectives in conjunction with providing wood and fiber for society. Multiple use objectives that may benefit from timber management are primarily those described in the Ecological Systems Diversity and Restoration sections of this Chapter. Commercial timber sales often provide the most cost effective method for creating early successional habitat, open woodland settings, and forest structural diversity. The timber sale program will also help maintain processes that allow for oak reproduction and may be used in the conversion of pine plantations to native pines and hardwood forests. A dual purpose of the timber management program is to provide a stable supply of wood products for local needs. The timber program may also provide supplies of those wood products where the Forest Service is in a unique position to make an impact on meeting the demand from emerging markets such as wood biomass energy.

A wide variety of even-aged, two-aged, and uneven-aged silvicultural systems and harvest methods are provided for in order to provide adequate flexibility to respond to the specific need for vegetation manipulation in a given area or situation. However, it is envisioned that two-aged systems, mainly shelterwood with reserves (previously known as "modified shelterwoods"), will be the primary harvest system utilized to achieve multiple use objectives and provide for a variety of wood products. The residual density of these regenerated stands may vary quite a bit, from roughly 15 to 40 square feet of basal area for instance, in order to achieve the objective at hand. Intermediate harvests such as pre-commercial and commercial thinning will also be utilized to enhance species composition to benefit wildlife, forest health, and/or commercial values, as well as to enhance growth rates, form and vigor of the residual trees. However, thinning and conventional shelterwood cuts should be deferred in areas where gypsy moth populations are increasing to, or are at, damaging levels (>1,400 egg masses per acre), so as to avoid compounding stresses resulting from harvest and defoliation thereby increasing the probability of significant mortality.

Wood biomass energy is become an emerging market in some areas of the Forest. The Forest Service realizes that developing and using renewable sources of energy are national goals and that woody biomass is a potential source of renewable energy and fuel. However, we do not envision the production of wood biomass energy to be a sole purpose and need of any commercial timber sale. Woody biomass utilization of smaller diameter trees not considered merchantable in traditional markets can also be used to facilitate forest restoration, increase the growth of higher-value trees and forest products, reduce forest fire risk, and support the removal of invasive species. Small scale local firewood vendors can play a significant role in economically achieving thinning objectives, especially in younger stands.

As defined in Appendix F-Glossary, woody biomass can include logging slash, limbs, tops, and small diameter trees that would typically be noncommercial. Woody biomass on the Forest will not include below ground

biomass, downed logs, or stumps. Review of scientific literature suggests that substantial removal of tree branches and foliage that typically contribute to the nutrient pool can have negative effects on long-term soil productivity. Intensive removal of woody biomass may especially cause nutrient depletion on sensitive sites such as those with shallow, coarse textured soils. Woody biomass utilization will be limited on soils identified as high risk for soil acidification and nutrient depletion due to atmospheric deposition. High risk soils are determined by using atmospheric deposition, elevation and geologic data as well as vegetation and soils information. Less woody biomass needs to remain on sites with existing large quantities of woody biomass on the ground or on sites where the harvest intensity is low. The following graph illustrates the approach we will follow in woody biomass utilization. The amount of woody biomass left on site will vary according to the productivity of the site, the amount of existing down woody debris on the site, and the intensity of the harvest. However, at least 30 percent of all logging slash will be retained on all regeneration sites. On poorer sites, like site index 50, about 60 percent of the logging slash will be retained. These guidelines were developed by the Forest Guild Southeast Biomass Working Group, 2012.

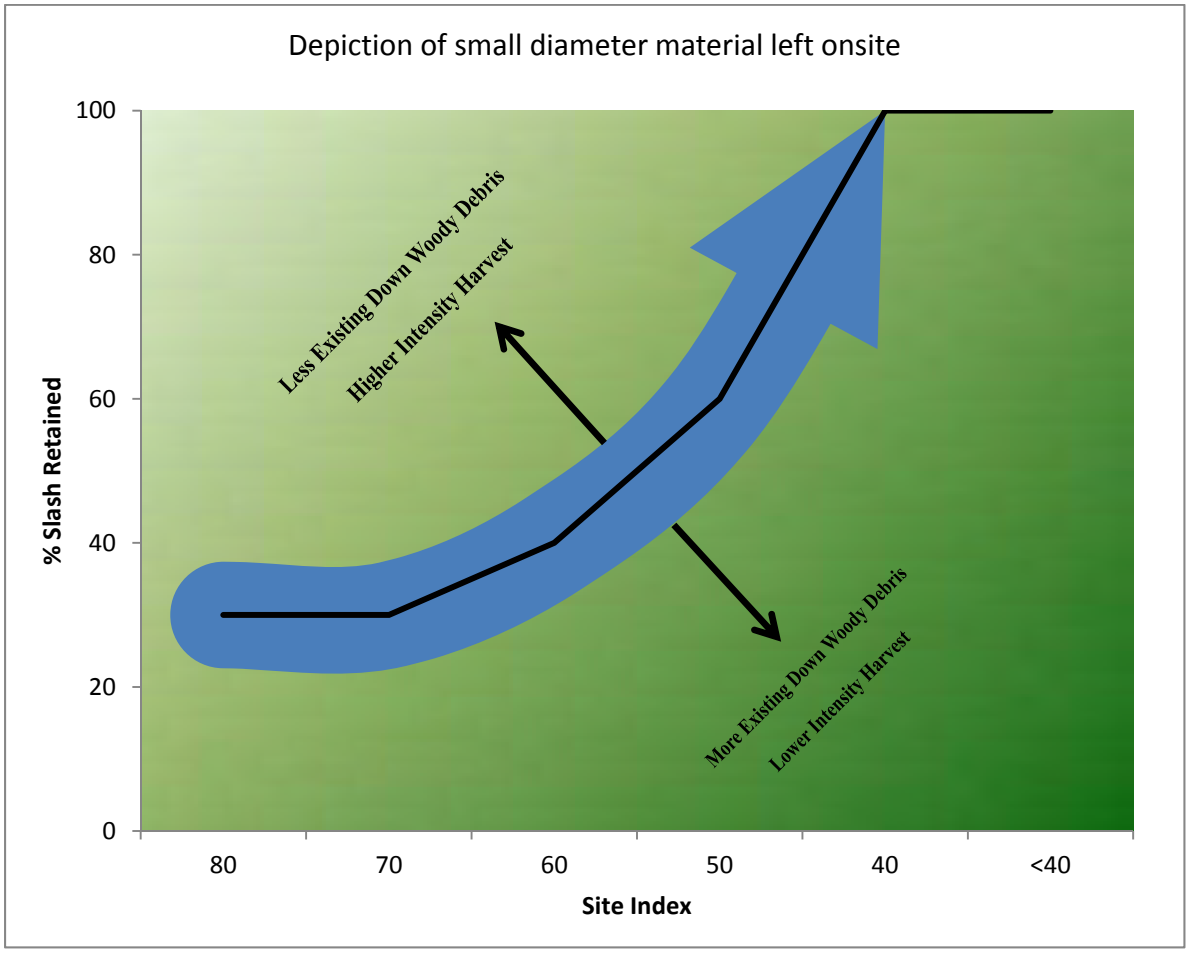

Figure 3-1. Slash Retention Guide for Regeneration Harvests

Objectives for Timber Management

OBJ TIM-1: A total timber sale program quantity (TSPQ) of 3.8 to 5.5 million cubic feet (MMCF) [19 to 27 million board feet (MMBF)] is provided annually from lands suitable for timber production. This equates to about 1,800 to 3,000 acres per year. The maximum Allowable Sale Quantity (ASQ) for the first decade is 55.3 MMCF.

OBJ TIM-2: Provide around 5,500 hundred cubic feet (CCF) of fuelwood available for personal use annually.

MINERAL RESOURCES

Management Approach

Energy-related Federal leases, licenses, and permits will be processed expeditiously, per Forest Service and Bureau of Land Management guidelines. Energy-related outstanding and reserved mineral rights operations will also be processed promptly. For non-energy mineral resources, emphasize authorizations of minerals needed for environmental protection, public infrastructure, flood protection, erosion control, and watershed restoration. Reclaim energy and non-energy mineral sites at the appropriate stage of the mineral operation. Identify opportunities for reclamation to achieve post-mine land uses that complement the desired conditions of the appropriate management prescription.

At the same time that the Forest Plan was completed, the GWNF also made the decision on which lands would be available for oil and gas leasing. This leasing availability decision, as described in the Record of Decision, makes National Forest System lands unavailable for federal oil and gas leasing. This decision does not affect existing oil and gas leases or privately owned oil and gas rights. Since this is a separate decision, new information could develop resulting in a new availability decision before the plan goes through another full revision. Therefore, this plan establishes a framework to guide any future availability decisions by including direction on the suitability of areas for leasing under various conditions and standards to direct drilling activities.

Under the framework described above, the Plan includes standards to reduce or eliminate many of the potential resource impacts from hydraulic fracturing and horizontal drilling. Public water supply watersheds as identified by the Commonwealth of Virginia for North River, Dry River-Skidmore (and watershed upstream of Dry River), Pedlar River (and watershed upstream of Pedlar River), Smith Creek, North Fork of Shenandoah, North Fork Shenandoah-Cedar Creek, Jackson River, and Coles Run are not suitable for oil and gas leasing. Areas with special biological concerns are suitable for leasing but only with No Surface Occupancy stipulations to prevent impacts to the sensitive resources in these areas. Controlled Surface Use stipulations are used to restrict road construction in semi-primitive recreation settings. The direction for each management prescription area identifies the type of stipulation that applies to oil and gas leasing as a suitable use. Whether land within that prescription area could become available (and the stipulations that apply) depends upon the decision on lands administratively available and if other characteristics of the land apply (like the presence of public water supply watersheds, Cow Knob salamander populations, or semi-primitive recreation settings).

The following list identifies the areas of the Forest that are suitable or not suitable for leasing. The list below is hierarchical. For example, if a semi-primitive setting occurs in a public water supply watershed, it would be not suitable for leasing because it is in a public water supply watershed.

Legally Unavailable for Leasing:
- Designated Wilderness
- Mount Pleasant National Scenic Area

Not suitable for Leasing:
- Public Water Supply Watersheds, as defined by the State (and the watersheds upstream of the Dry River PWS and the Pedlar River PWS)
- Laurel Fork area
- Recommended Wilderness Study Areas
- Shenandoah Mountain Recommended National Scenic Area
- Indiana Bat Primary Cave Protection Areas
-

Suitable, with a No Surface Occupancy Stipulation:
- Special Biological Areas
- Shenandoah Crest (and other areas known to support Cow Knob salamanders)
- Key Natural Heritage Community Areas

- Appalachian National Scenic Trail corridor
- Cultural/Heritage Areas
- Indiana Bat Secondary Protection Areas
- Eligible Wild and Scenic River Corridors
- Research Natural Areas
- Remote Backcountry Areas, includes all Inventoried Roadless Areas

Suitable, with a Controlled Surface Use Stipulation:

- Highlands Scenic Tour Byway
- Scenic Corridors and Viewsheds
- Concentrated Recreation Areas
- Blue Ridge Parkway Corridor
- Riparian Areas and Corridors
- Semi-Primitive Motorized or Semi-Primitive Non-Motorized settings

Suitable, with Standard Lease Terms:

- Administrative Sites
- Communication Sites
- Utility Corridors
- All-Terrain Vehicles Use Areas
- Dispersed Recreation Areas
- Pastoral Landscape and Rangelands
- Mosaics of Habitat

In approving Surface Use Plans of Operation, the Forest Service will encourage operators to monitor any private wells located within 1,000 feet of gas wells drilled on the Forest. The Forest Service may also require the installation of monitoring wells on the Forest.

INVENTORIED ROADLESS AREAS

Management Approach

All of the Inventoried Roadless Areas (IRAs) that are not recommended for wilderness study have direction to maintain their roadless character and they will be managed consistent with the requirements of the 2001 Roadless Area Conservation Rule. Most of these IRAs are assigned to the Remote Backcountry Management Prescription Area. For the recommended National Scenic Area (NSA), direction will be dependent upon the authorizing legislation, but until designation any IRAs within the NSA will be managed consistent with the requirements of the 2001 RACR. Portions of IRAs that are in other management prescription areas are noted on the maps in Appendix I and have specific direction for management consistent with the requirements of the 2001 Roadless Area Conservation Rule.

OLD GROWTH

Management Approach

Existing, Possible and Future old growth will be identified as described in Appendix B of this Plan and in accordance with *Guidance for Conserving and Restoring Old Growth Forest Communities on National Forests in the Southern Region*. Currently, little existing old growth has been verified on the ground. However, the amount of Possible and Future old growth is large. Existing old growth, as it is identified, will be managed based on the old growth forest type and the representation of that type in the Existing, Possible and Future old growth inventories. In Northern Hardwood, Hemlock-Northern Hardwood, White Pine-Northern Hardwood, Spruce Northern Hardwood, Mixed Mesophytic, Hardwood Wetland Forests, Dry and Xeric Oak Forest, Xeric Pine and Pine-Oak Forest and Woodland, Eastern Riverfront, Rocky, Thin-Soil Conifer Woodland old growth forest types, any existing old growth will be unsuitable for timber production. In the Dry-Mesic Oak Forest and

Dry and Dry-Mesic Oak-Pine old growth forest types, any existing old growth, in areas suitable for timber production, will be evaluated during project analysis to determine its suitability for harvest. If, during project analysis, it can be demonstrated that an identified existing old growth patch does not contribute to the Forest old growth inventory, then the patch could be suitable for timber production and harvest of the patch could occur. The project analysis will include a discussion of the old growth characteristics found in the area, the effect of the action on these characteristics, and the effect the action will have on the contribution of the area to the Forest's old growth inventory.

Objectives for Old Growth

OBJ OLD-1: The following possible old growth (based on stand age criteria alone) acres of each community type are maintained in an old growth or late-successional condition by the end of the first decade to ensure the integrity of ecological function and to ensure old growth systems on the GWNF are sustainable.

Table 3-4. Possible Old Growth Acres Objective

Old Growth Forest Type Group	Current Acres	After First Decade Acres
1 - Northern Hardwood Forests	1,200	4,500
2a-Hemlock-North. Hardwood Subgroup	2,500	3,000
2b-White Pine-North. Hardwood Subgroup	700	1,700
2c-Spruce-North. Hardwood Subgroup	100	100
5 - Mixed Mesophytic Forests	5,100	7,900
10 - Hardwood Wetland Forests	0	0
21 - Dry-Mesic Oak Forests	151,300	204,800 – 207,200
22 - Dry and Xeric Oak Woodlands	300	500
24 - Xeric Pine & Pine-Oak Forests	66,500	101,800
25 - Dry & Dry-Mesic Oak-Pine Forests	16,800	35,600 - 36,200
28 - Eastern Riverfront Forests	6	25
TOTAL ACRES	244,506	362,925

SUITABLE USES OVERVIEW

Suitability (36 CFR 219.3, 219.14): The appropriateness of applying certain resource management practices to a particular area of land, as determined by an analysis of the economic and environmental consequences and the alternative uses foregone. A unit of land may be suitable for a variety of individual or combined management practices. In addition, the National Forest Management Act requires plans to identify lands that are not suitable for timber production.

National Forest System lands are suitable for a variety of multiple uses (36 CFR 219), including outdoor recreation, livestock grazing, timber harvest, wildlife habitat, Wilderness, energy resource development, mining activities, watershed restoration, and cultural and heritage interpretation, among others.

A plan must identify National Forest System lands as not suited ("unsuitable") for a certain use under the following circumstances:

1) If law, regulation, or Executive Order prohibits that use.
2) If agency resource management directives prohibit the use.
3) If the use would result in substantial and permanent impairment of the productivity of the land or renewable resources.
4) If the use is incompatible with the desired conditions established for all or part of the plan area.

SUITABLE USES — KEY ACTIVITIES

The following table is a summary of some of the key suitable uses as defined by the management prescription area descriptions found in Chapter 4. However, it is strongly recommended that Chapter 4 be consulted for the complete understanding of management prescription area direction as some of the uses have certain restrictions or circumstances related to a suitable use within that management prescription area.

Table 3-5. Lands Suitable for Key Activities

Management Prescription Area		Timber Production	Timber Harvest for Other Resource Objective	Salvage	Permanent Road Construction	Temporary Road Construction
1A	**Designated Wilderness**	No	No	No	No	No
1B	**Recommended Wilderness Study Areas**	No	No	No	No	No
2C2	**Eligible Scenic River Corridors**	No	No	No	No	No
2C3	**Eligible Recreation River Corridors**	No	Yes	Yes	Yes	Yes
4A	**Appalachian Trail Corridor**	No	Limited	No	Limited	Limited
4B	**Research Natural Areas**	No	No	No	No	No
4C1	**Geologic Areas**	No	No	Limited	No	No
4D	**Special Biological Areas**	No	Limited	Limited	Limited	Limited
4D1	**Key Natural Heritage Community Areas**	No	Limited	Limited	Limited	Limited
4E	**Cultural/Heritage Areas**	No	Limited	Yes	Limited	No
4F	**Mt Pleasant National Scenic Area**	No	No	No	No	No
4FA	**Shenandoah Mountain Recommended National Scenic Area**	No	No	No	No	No
5A	**Administrative Sites**	No	Limited	Yes	Yes	Yes
5B	**Communication Sites**	No	Limited	Yes	Yes	Yes
5C	**Utility Corridors**	No	Limited	Yes	Yes	Yes
7A1	**Highlands Scenic Tour Byway**	Yes	Yes	Yes	Yes	Yes
7B	**Scenic Corridor and Viewsheds**	Limited	Yes	Yes	Yes	Yes

Management Prescription Area		Timber Production	Timber Harvest for Other Resource Objective	Salvage	Permanent Road Construction	Temporary Road Construction
7C	**All-Terrain Vehicle Areas**	Yes	Yes	Yes	Yes	Yes
7D	**Concentrated Recreation Zones**	No	Limited	Yes	Yes	Yes
7E1	**Dispersed Recreation-Unsuitable for Timber Production**	No	Yes	Yes	Yes	Yes
7E2	**Dispersed Recreation-Suitable for Timber Production**	Yes	Yes	Yes	Yes	Yes
7F	**Blue Ridge Parkway Corridor**	Limited	Yes	Yes	Yes	Yes
7G	**Pastoral Landscapes and Rangelands**	No	Yes	Yes	Yes	Yes
8E4a	**Indiana Bat Primary Protection Areas**	No	No	No	No	No
8E4b	**Indiana Bat Secondary Protection Areas**	Yes	Yes	Yes	Yes	Yes
8E7	**Shenandoah Mtn Crest - Cow Knob Salamander**	No	No	Limited	No	No
11	**Riparian Areas and Corridors**	Limited	Yes	Limited	Limited	Limited
12D	**Remote Backcountry Areas**	No	No	No	No	No
13	**Mosaics of Habitat Areas**	Yes	Yes	Yes	Yes	Yes

WIND ENERGY DEVELOPMENT (UTILITY-SCALE)

The following Management Prescription Areas are not suitable for consideration of wind energy development:

- Designated Wilderness (1A)
- Recommended Wilderness Study Areas (1B)
- Eligible Scenic River Corridors (2C2)
- Eligible Recreation River Corridors (2C3)
- Appalachian Trail Corridor (4A)
- Research Natural Areas (4B)
- Geologic Areas (4C1)
- Special Biological Areas (4D)
- Key Natural Heritage Community Areas (4D1)
- Cultural Areas (4E)
- Mount Pleasant National Scenic Area (4F)
- Shenandoah Mountain Recommended National Scenic Area (4FA)
- Scenic Corridors and Viewsheds (7B)
- Developed Recreation Areas (7D)
- Blue Ridge Parkway Scenic Corridor (7F)
- Indiana Bat Protection Areas (8E4a, 8E4b)
- Shenandoah Mountain Crest – Cow Knob Salamander Area (8E7)
- Remote Backcountry Areas (12D)

LANDS SUITABLE FOR TIMBER PRODUCTION

During forest land and resource management planning, the Forest Service is required to identify lands unsuited for timber production (16 USC 1604(k); 36 CFR 219.14). 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. For purposes of forest planning, timber production does not include the production of fuelwood or harvests from unsuitable lands." (36 CFR 219.3, 1982 rule). This identification process involves three stages of analysis. Stage I analysis identifies lands tentatively suitable for timber production. Stage II analysis is designed to explore the financial aspect of varying intensities of timber management on lands identified as tentatively suitable for timber production from Stage I. Stage III analysis identifies the final set of lands as unsuited for timber as determined by the desired conditions and land allocations in the revised Forest Land and Resource Management Plan.

STAGE I: PHYSICAL SUITABILITY

The first stage of the timber suitability analysis addresses the administrative and physical suitability of the land to be managed for the production of timber. Stage I lands unsuitable for timber production include:

- Lands that do not meet the definition of forest land (land at least 10% occupied by forest trees of any size).
- Lands that have been administratively or congressionally withdrawn from timber production by an act of Congress, the Secretary of Agriculture, or the Chief of the Forest Service.
- Forest lands incapable of producing industrial wood.
- Lands where technology is not available to ensure timber production from the land without irreversible soil and water resource damage.

- Lands where there is no reasonable assurance that they can be adequately restocked.
- Lands where there is inadequate information.

Table 3-6 describes the information used to estimate the acreage within the six categories of the Stage I tentatively suitable lands. It is important to note that the net acres displayed in Table 3-7 refer to the acres within that particular category that have not already been removed in a previous category. For instance, there are a total of some 41,000 acres on the Forest that meet the criteria for 'Irreversible Damage and Can't Restock', but only about 29,000 are shown as removed because the other 12,000 acres were already removed by the 'Withdrawn' category.

Table 3-6. Tentatively Suitable Acres for Timber Production (Stage I Suitability Analysis)

Categories of Stage I Unsuitable Lands	Defining Information	Current Net Acres
Total National Forest System Lands:		1,065,000
1. Non Forest Land	FSVeg Land Class Codes: 110-Lake 120-Reservoir 140-River 210-Cemetery 220-Powerline 230 Road/Railroad 240-Special Use 250-Wildlife Clearing	(7,000)
2. Withdrawn	Designated Wilderness (1A) Mt. Pleasant National Scenic Area (4F) Research Natural Areas (4B)	(53,000)
3. Irreversible Damage	Land Class Code: 826-Physical barriers AND Site Index < 70	(28,000)
4. Can't Restock	Forest Type: 99–Brush AND Stand Condition Class: 15–Non Stocked	(1,000)
5. Incapable of producing industrial wood	Land Class Code: 900–Incapable of Industrial Wood OR Site Index < 40	(65,000)
Tentatively Suitable Forest Lands		911,000

STAGE II: FINANCIAL ANALYSIS

The second stage analysis is designed to explore the financial efficiency of different timber intensities on the lands identified as tentatively suitable for timber production in Stage I. It does not identify any lands as unsuitable for timber production. Stage III analysis considers the results of these financial efficiencies in making the final determination of lands suited for timber production.

STAGE III: IDENTIFICATION OF SUITABLE ACRES

The third stage analysis is determined by Forest Plan direction. Several criteria were used during this stage to identify lands in this category:

- Based upon consideration of multiple-use objectives, the land is proposed for resource uses that preclude timber production. However, in some management prescription areas that are classified as unsuitable for timber production, timber harvest may occur to meet the desired condition of other resources.
- Other management objectives limit timber production activities to the point where management requirements set forth in 36 CFR 219.27 cannot be met.
- The lands are not cost-efficient, over the planning horizon, in meeting forest objectives, which includes timber production.

Table 3-7 describes the information used to estimate the acreage within the two categories of the Stage III tentatively suitable lands.

Table 3-7. Final Suitable Acres for Timber Production (Stage III Suitability Analysis)

Categories of Stage III Unsuitable Lands	Defining Information	Current Net Acres
Tentatively Suitable Forest Lands from Stage I Analysis		911,000
1. Withdrawn for Other Resource Purposes – by Management Prescription Area	Recommended Wilderness Study Areas (1B) Eligible Scenic River Corridors (2C2, 2C3) Appalachian Trail Corridor (4A) Geologic Areas (4C1) Special Biologic Areas (4D) Special Heritage Areas (4E) Key Natural Heritage Community Areas (4D1) Shenandoah Mountain Recommended National Scenic Area (4FA) All Administrative Areas (5A, 5B, 5C) Concentrated Recreation Zones (7D) Dispersed Recreation Areas-Unsuitable for Timber Production (7E1) Blue Ridge Parkway Corridor (7F) Pastoral Landscapes (7G) Indiana Bat Primary Areas (8E4a) Riparian Corridors (11) Remote Backcountry Areas (12D) Possible Old Growth not in Old Growth Forest Types 21 & 25	(344,000)
2. Lands Not Appropriate Because They Are Not Cost-Effective to Achieve Timber Production Goals	Site Index <= 40 OR Slope >55% and Forest Type <> 48, 53, 56 and 81*	(115,000)
Total Suitable Land		452,000

* Forest types 48, 53, 56, and 81 are northern red oak-hickory-yellow pine, white oak-red oak-hickory, yellow poplar-white oak-red oak, and sugar maple-beech-yellow birch, respectively.

Lands suitable for timber production are located in eight management prescriptions. These prescriptions contain both suitable and unsuitable lands. Final determination of suitability for timber production is determined at the site-specific project level. During this project level determination, lands identified as suitable for timber production must total no more than 452,000 acres across the forest.

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CHAPTER 4 – DESIGN CRITERIA

STANDARDS OVERVIEW

While desired conditions and objectives define where we are headed with management of the George Washington National Forest, standards define the "boundaries" we are to follow in designing projects. Standards place limitations on management activities or resource uses, generally for environmental protection, public safety, or resolution of an issue. In essence, standards put a condition on the application of a suitable use.

Forestwide standards apply to the entire Forest unless superseded by specific management prescription area direction. When a management prescription is silent regarding a specific resource activity, the forestwide direction applies. These standards are generally listed with the primary management activity or geographic area under consideration. For example, a standard related to riparian areas while conducting a timber sale would be listed under Vegetation Management. A standard related to Mount Pleasant National Scenic Area would be listed under Mount Pleasant National Scenic Area. However, care should be taken to be aware of the applicability of all standards during project design and implementation.

In addition to the standards found in this Forest Plan, the Forest is required to comply with applicable laws, executive orders, and regulations, manuals, and handbooks.

FORESTWIDE STANDARDS

Watershed Resources

WATER AND SOIL QUALITY

FW-1 Resource management activities that may affect soil and/or water quality meet or are more stringent than Virginia and West Virginia Best Management Practices, State Erosion Control Handbooks, and standards in this Forest Plan.

FW-2 Locate all facilities (e.g. trails, trail shelters, restrooms, designated campsites, etc.) in a manner that minimizes the possibility of contamination of water sources. Educate users on "leave no trace" camping practices, including sanitation practices that minimize the potential for contamination of water sources.

FW-3 Prior to authorizing or re-authorizing new or existing diversions of water from streams, lakes, ponds, springs, or ground water, determine the instream flow or water level needs sufficient to protect stream processes, aquatic and riparian habitats and communities, and recreation and aesthetic values.

FW-4 Water is not diverted from streams (perennial or intermittent), lakes, ponds, springs, or ground water, when an instream flow needs 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.

FW-5 On all soils dedicated to growing vegetation, the organic layers, topsoil and root mat will be left in place over at least 85% of the activity area and revegetation is accomplished within 5 years. (The activity area is the area of potential soil disturbance expected to produce vegetation in the future, for example: timber harvest units, prescribed burn area, grazing allotment, etc.)

FW-6 Locate and design management activities to avoid, minimize, or mitigate potential erosion.

FW-7 Use ditchlines and culverts when new permanent road construction grades are more than 6% and the road will be managed as open for public use.

FW-8 Water saturated soils in areas expected to produce biomass should not receive vehicle traffic or livestock trampling to prevent excessive soil compaction.

FW-9 Where soils are disturbed by management activities, appropriate revegetation measures should be implemented. When outside the normal seeding seasons, initial treatments may be of a temporary nature, until permanent seeding can be applied. Revegetation should be accomplished within 5 years. For erosion control, annual plants should make up >50% of seed mix when seeding outside the normal seeding season and the area should be reseeded with perennials within 1½ years.

FW-10 Adjacent to municipal reservoirs, a lakeside management zone shall exist that extends at least 100 feet from the shore for land slopes of 10 percent or less, 150 feet for slopes of 11 percent to 45 percent, and 200 percent for slopes greater than 45 percent.

FW-11 To protect long-term soil productivity and ecological sustainability:

- No woody biomass utilization is allowed in forested stands less than or equal to site index 40 or in stands with high risk soils.
- In forested stands greater than site index 40, leave at least 30% of the logging slash created by regeneration harvests.
- No below ground biomass, existing downed woody material, or stumps will be removed for woody biomass utilization.
- The determination of woody biomass utilization will depend upon site-specific analysis.
- Generally, logging slash should be distributed more or less evenly across the harvest area.

FW-12 Clearcutting is not allowed where high risk soils (as described in Chapter 3-Management Approach for Soils and in the Glossary) are identified.

FW-13 There are no woody biomass utilization limits for thinning operations that leave a fully stocked residual stand except as identified in FW-11.

AIR QUALITY

Standards for air quality related to prescribed fire use are found in the Fire Management section of this chapter.

FW-14 Conduct all National Forest management activities (including permitted activities) in a manner that does not result in a significant contribution to: (1) a violation of National Ambient Air Quality Standards; or (2) a violation of applicable provisions in the State Implementation Plan.

RIPARIAN AREAS AND CORRIDORS

Riparian areas and corridors are managed according to Management Prescription Area 11. See Appendix A for the definitions of riparian areas and corridors.

CHANNELED EPHEMERAL ZONES

The following standards apply to 25 feet on each side of a channeled ephemeral stream and 25 feet upstream from the point at which the scoured channel begins (the “nick point”).

FW-15 Motorized vehicles are restricted in the channeled ephemeral zone to designated crossings. Motorized vehicles may only be allowed on a case-by-case basis, after site-specific analysis, in the channeled ephemeral zone outside of designated crossings.

FW-16 Management activities expose no more than 10% mineral soil in the channeled ephemeral zone.

FW-17 Up to 50% of the basal area may be removed, down to a minimum basal area of 50 square feet per acre. Removal of additional basal area is allowed on a case-by-case basis when needed to benefit riparian-dependent resources.

FW-18 Permitted firewood cutting within the channeled ephemeral zone must take into consideration large woody debris needs. Ranger Districts will identify areas where firewood cutting is not permitted due to large woody debris concerns.

FW-19 At least partial suspension is required when yarding logs over channeled ephemeral streams.

FW-20 Large woody debris may be removed if it would otherwise pose a risk to water quality, degrades habitat for aquatic or riparian wildlife species, impedes water recreation (e.g. rafting), or when it poses a threat to private property or Forest Service infrastructure (e.g. bridges). The need for removal is determined on a case-by-case basis.

FW-21 The addition of large woody debris in channeled ephemeral reaches will primarily be through passive recruitment rather than active placement.

FW-22 New human-constructed impoundments are allowed on a case-by-case basis, following evaluation of downstream instream flow needs.

FW-23 When crossing channeled ephemeral streams, culverts, temporary bridges, hardened fords, or corduroy are used where needed to protect channel or bank stability.

FW-24 Construction of crossings is completed on all channeled ephemerals as soon as possible after work has started on the crossing. Permanent and temporary roads on either side of crossings within the channeled ephemeral zone are graveled.

FW-25 If culverts are removed, banks and channel must be restored to a natural size and shape. All disturbed soil must be stabilized.

FW-26 Trails, campsites, and other recreational developments are located, constructed, and maintained to minimize impacts to channel banks and to prevent other resource damage. When existing facilities are causing unacceptable resource damage, appropriate mitigation measures will be implemented. Soils are stabilized on eroding trails and recreational sites.

FW-27 New non-motorized trail construction is allowed to improve existing trail configuration and improve access.

FW-28 New motorized trails are prohibited within the channeled ephemeral zone except at designated crossings or where the trail location requires some encroachment; for example, to accommodate steep terrain.

FW-29 Motorized and non-motorized trail reconstruction and relocation within the channeled ephemeral zone are allowed to reduce impacts to riparian and aquatic resources.

FW-30 Where grazing is currently allowed and under a permit, control and mitigate to restore, enhance, or maintain the integrity of channels and banks. Grazing permit reauthorization is allowed, provided progress towards mitigation of negative impacts on the channeled ephemeral zones has occurred. New grazing permits will be designed to prevent negative impacts to the channeled ephemeral zone. Livestock will be excluded from channeled ephemeral zones whenever the zone cannot be maintained or restored otherwise.

FW-31 Feeding troughs and salt and mineral blocks are not allowed inside the channeled ephemeral zone. Watering troughs are appropriately located to protect the streams.

FW-32 During prescribed fire operations in the channeled ephemeral zone, use the least ground disturbing method of fireline construction, favoring blacklines and handtools.

FW-33 Do not disk, blade, or plow fireline within the ephemeral stream channels, use them as natural firebreaks. (This applies to the actual stream channel, not the entire 25 foot zone.)

FW-34 Revegetate and waterbar firelines as quickly as possible, where necessary to prevent erosion. Use water diversions to keep sediment out of channels.

AQUATIC SPECIES

See Management Prescription Area 11 (Riparian Areas) for aquatic species management direction.

Ecological and Species Diversity

FW-35 Retain soft mast producing species (dogwood, black gum, hawthorne, grapes, serviceberry, etc.) during vegetation management treatments when consistent with overall regeneration and species composition objectives.

FW-36 Favor the retention of large (>20" dbh) standing snags and den trees when implementing silvicultural treatments. Active bear den trees are retained in harvest areas along with an unharvested buffer of at least 100 feet wide on all sides of the den.

THREATENED, ENDANGERED AND SENSITIVE SPECIES MANAGEMENT

FW-37 Maintain records of locations and conditions of federally listed threatened and endangered species and of Regional Forester's sensitive species within the planning area.

FW-38 Control non-native invasive species where they are causing negative effects to threatened, endangered, or sensitive species. Do not intentionally introduce non-native species that are known or suspected of causing negative effects to federally-listed threatened and endangered species in or near sites supporting these species.

FW-39 Do not issue permits for collection of threatened, endangered, sensitive, and locally rare species, except for approved scientific purposes.

BALD EAGLE MANAGEMENT

FW-40 Follow National Bald Eagle Management Guidelines. Avoid timber harvesting operations within 660 feet of an active nest during breeding season. Prescribed burning and other management activities designed to conserve or enhance habitat should be undertaken outside of breeding season around active nest trees. During wildland fire operations, avoid operating helicopters or other fixed-wing aircraft within 1,000 feet of an active nest during the breeding season.

PEREGRINE FALCON MANAGEMENT

FW-41 Post and enforce seasonal closure orders near active peregrine falcon nests during season of use to control human disturbance.

VIRGINIA NORTHERN FLYING SQUIRREL MANAGEMENT

FW-42 Follow the USFWS Recovery Plan for Virginia Northern Flying Squirrel, as amended.

FW-43 Known occurrences of the northern flying squirrel are allocated to Management Prescription 4D-Special Biological Areas, to ensure protection and maintenance of their current populations and surrounding habitat conditions.

MANAGEMENT OF FEDERALLY-LISTED PLANTS

FW-44 Known occurrences of northeastern bulrush, Virginia sneezeweed, swamp pink, shale barren rock cress, and smooth cone flower are allocated to Management Prescription Area 4D-Special Biological Areas to ensure protection and maintenance of their current populations and surrounding habitat conditions.

COW KNOB SALAMANDER MANAGEMENT

FW-45 If Cow Knob salamanders are found in areas outside the Shenandoah Mountain Crest management prescription area, those areas will be subject to the same management measures as described in the Shenandoah Mountain Crest Management Prescription Area 8E7.

VIRGINIA BIG-EARED BAT MANAGEMENT

FW-46 See standards related to Caves.

INDIANA BAT MANAGEMENT

FW-47 Each Indiana bat hibernaculum has a primary and secondary cave protection area managed according to Management Prescription Area 8E4. If additional hibernacula are found, the desired condition and standards of Management Prescription Area 8E4 apply until an environmental analysis to consider amendment to the Forest Plan is completed.

FW-48 In order to promote potential summer roost trees and maternity sites for the Indiana bat throughout the Forest, planned silvicultural practices in hardwood-dominated forest types will leave all shagbark hickory trees greater than 6 inches diameter at breast height (dbh), except when they pose a safety hazard. In addition:

- Clearcut openings 10 to 25 acres in size will also retain a minimum average of 6 snags or cavity trees per acre, 9 inches dbh or larger, scattered or clumped.
- Group selection openings and clearcuts less than 10 acres in size have no provision for retention of a minimum number of snags, cavity trees, or residual basal area due the small opening size and safety concerns.
- All other harvesting methods (and clearcut openings 26-40 acres in size) will retain a minimum residual 15 square feet of basal area per acre (including 6 snags or cavity trees) scattered or clumped. Residual trees are greater than 6 inches dbh with priority given to the largest available trees, which exhibit characteristics favored as roost trees by Indiana bats.

FW-49 To insure a continuous supply of roost trees and foraging habitat, the following forestwide conditions must be maintained:

- Minimum of 60% of the combined acreage of all FSVEG Forest Types on the Forest will be maintained over 70 years of age; AND
- Minimum of 40% of the combined acreage of all FSVEG Forest Types 53 (white oak, red oak, hickory) and 56 (yellow poplar, white oak, red oak) will be maintained at an age greater than 80 years old.

FW-50 When active roost trees are identified on the Forest, they will be protected with a ¼ mile buffer surrounding them. This protective buffer remains until such time the trees and associated area no longer serve as a roost (e.g. loss of exfoliating bark or cavities, blown down, or decay).

FW-51 No disturbance that will result in the potential taking of an Indiana bat will occur within an active roost tree buffer.

- Commercial timber harvesting, road construction, and use of the insecticide diflubenzuron (Dimilin) are prohibited.
- Prescribed burning, timber cutting, road maintenance, and integrated pest management using biological or species-specific controls during non-roosting season are allowed, following project level analysis to determine the direct, indirect, and cumulative effects on Indiana bats and the hibernacula.
- Other activities within this buffer are allowed following determination that they will not result in a potential taking of an Indiana bat.

FW-52 Removal of known Indiana bat active roost trees will be avoided, except as specified in the next two standards.

FW-53 If during project implementation, active roost trees are identified, all project activity will cease within a ¼ mile buffer around the roost tree until consultation with U.S. Fish and Wildlife Service is completed to determine whether project activities can resume.

FW-54 In the event that it becomes absolutely necessary to remove a known Indiana bat active roost tree, such a removal will be conducted during the time period when the bats are likely to be in hibernation (November 15 through March 31), through informal consultation with the U.S. Fish and Wildlife Service. Trees identified as immediate threats to public safety may be removed when bats are not hibernating; however, informal consultation with U.S. Fish and Wildlife Service is still required. Examples of immediate threats to public safety include trees leaning over a trail, public road or powerline that could fall at any time due to decay or damage.

FW-55 Prescribed burning is allowed to maintain flight and foraging corridors in upland and riparian areas potentially used by bats in the summer. To avoid injury to non-flying young Indiana bats, prescribed burning within 2.5 miles of known active maternity roosting sites between June 1 and August 1 is prohibited.

FW-56 Opportunities should be sought to include creation of drinking water sources for bats in project plans, where appropriate, in areas where no reliable sources of drinking water are available. Opportunities will be considered when the creation is not detrimental to other wetland-dependent species (i.e., damage to natural springs and seeps).

FW-57 If active maternity roost sites are identified on the Forest, they will be protected with a 2.5-mile buffer defined by the maternity roost, alternate roost sites, and adjacent foraging areas.

FW-58 No disturbance that will result in the potential taking of an Indiana bat will occur within this active maternity roost site buffer.

- Commercial timber harvesting, road construction, and use of all insecticides (are prohibited.
- All other activities within this buffer will be evaluated during project level analysis to determine the direct, indirect, and cumulative effects on Indiana bats, through informal consultation with the U.S. Fish and Wildlife Service.

FW-59 If during project implementation, active maternity roost sites are identified, all project activity will cease within a 2.5-mile buffer around the maternity roost until consultation with U.S. Fish and Wildlife Service is completed to determine whether project activities can resume.

FW-60 Monitoring of timber sales and other activities will be implemented as follows:

- Timber sale administrators or biologists will conduct and report normal inspections of all timber sales to ensure that measures to protect the Indiana bat have been implemented. Timber sale administrators will conduct normal inspections of all timber sales to administer provisions for protecting residual trees not designated for cutting under provisions of the timber sale contract. Unnecessary damage to residual trees will be documented in sale inspection reports and proper contractual or legal remedies will be taken. The Forest will include this information in their annual monitoring reports and make available to the U.S. Fish and Wildlife Service, if requested.
- Informal consultations among the U.S. Fish and Wildlife Service and the Forest will occur as needed in order to review and determine any need to modify provisions of the biological opinion, and other issues regarding the Indiana bat.

FW-61 Where appropriate, training should be conducted for employees regarding bats in the national forests. Training should include sections on bat identification, biology, habitat requirements, and sampling techniques.

FW-62 Develop informational and educational displays about bats to inform the public about this misunderstood group of mammals.

RARE NATURAL COMMUNITIES

FW-63 In cooperation with the States' Natural Heritage agencies, make appropriate adjustments to Management Prescription Area 4D-Special Biological Areas through the Forest Plan amendment process as new rare community location and management information becomes available.

FW-64 Maintain records of rare community locations and conditions across the forest. Project areas are surveyed for rare communities prior to implementing projects that have the potential to negatively affect them.

SPECIES DIVERSITY

Species within in the Species Groups highlighted below are identified in the Species Diversity Report (FEIS Appendix F).

FW-65 When land disturbing projects are proposed in cliff, talus and large rock outcrop areas: a) identified species associated with the Cliff, Talus and Rock Outcrop Species Group will be searched for; and b) effects of the proposed project on these species will be evaluated.

FW-66 When land disturbing projects are proposed in areas where members of the Lepidopteran Species Group occur: a) the area where the species occurs and adjacent habitat will not be treated with Dimilin, BT or other insecticides that kill lepidopterans other than gypsy moth; and b) the entire area where the species occurs will not be part of a single prescribed burn; burning will be done only in patches of the occupied habitat.

FW-67 When land disturbing projects are proposed in areas where members of the Species Needing Occurrence Protection Species Group are likely to occur (known county, proximity to known populations, suitable habitat): a) identified species associated with this species group will be searched for; and b) effects of the proposed project on the species will be evaluated.

FW-68 Manage the old home sites, roadsides, and old fields where members of the Ruderal Species Group are found in conditions that maintain their open character.

FW-69 Limit collection of species identified in the Species Sensitive to Over Collection Species Group to approved scientific purpose, specifically: a) limit permission to collect these species; b) limit sharing of location information of these species; c) avoid improving access to these locations; d) evaluate seasonal closure of access to these locations; and e) evaluate relocation of access to these locations.

FW-70 For species in the Species Sensitive to Recreational Traffic Species Group: a) provide education regarding the recreational impacts to these species; b) alert recreation users of the concerns in the area; c) avoid improving access to these locations; d) evaluate seasonal closure of access to these locations: and e) evaluate relocation of access to these locations.

CAVES

FW-71 A minimum of 200 foot buffers are maintained around cave entrances and around areas known to open into a cave's drainage system like sinkholes, and cave collapse areas. There are no soil-disturbing activities or harvest of trees within this buffer. Wider buffers are identified through site-specific analysis when necessary to protect caves from potential subterranean and surface impacts.

FW-72 The use of caves for disposal sites or the alteration of cave entrances is prohibited except for the construction of cave gates or similar structures to ensure closure.

FW-73 Management activities within any area draining into a cave are limited if they may affect the cave ecosystem through sedimentation, soil sterilization, the addition of nutrients or other chemicals

(including pesticides and fertilizers), or if they change the cave's natural hydrology or micro-climate.

FW-74 Post and enforce seasonal closure orders around entrances of caves and abandoned mines occupied by significant populations of bats, to reduce the frequency and degree of human intrusion. Prohibit camping and campfires at the entrance to caves, mines, and rock shelters used by bats.

FW-75 If such closure orders are found to be ineffective, construct and maintain gates or other structures that allow for entrance and egress by bats. If necessary to further discourage human disturbance to caves occupied by significant populations of bats, close non-essential public access routes controlled by the Forest Service within ¼ mile of cave entrances during periods of use by bats.

FW-76 Human access to caves for educational and recreation use may be allowed during periods when bats are not present. If damage to a cave occurs as a result of such use, close the cave. Allow human access (i.e. scientific study) on a case-by-case basis when bats are present.

FW-77 The specific location of a Significant Cave (as defined in the Cave Resources Protection Act) cannot be made available to the public unless it is determined that disclosure of this information would not create a substantial risk of harm, theft, or destruction of the cave. Significant and potentially significant caves on the Forest are managed in accordance with the Cave Resources Protection Act of 1988 (16 U.S.C. 4301-4309) to protect them through regulating their use, requiring permits for removal of their resources, and prohibiting destructive acts.

Vegetation, Old Growth and Forest Health

VEGETATION

FW-78 Structural diversity may be increased through pre-commercial thinning, commercial thinning, uneven-aged management, creating canopy gaps and openings 0.25 to 2 acres in size using non-commercial cut and leave treatments, or a combination of these treatments when compatible with the desired condition and standards of the appropriate management prescription. Due to practical considerations, these treatments typically occur on slopes less than 30%, although there is no restriction on steeper slopes if feasible. Even-aged stand regeneration treatments, where desired, may occur later in the life of these stands.

FW-79 When regenerating forest stands, regenerate to native tree species that commonly occur naturally on similar sites within that land type association.

FW-80 To the extent practical, control threats from insects and disease in the Spruce Forest Ecological System.

FW-81 Design all silvicultural treatments in the Spruce Forest Ecological System to maintain or restore the forest type.

FW-82 During silvicultural treatments in all forest types, patches of live Eastern hemlock greater than ¼ acre are retained.

FW-83 In order to maintain future restoration opportunities, do not cut live Carolina hemlock. Exceptions may be made to provide for public safety, protection of private resources, insect and disease control, or research.

FW-84 During silvicultural treatments, retain all live butternut with more than 50% live branches. Record the approximate location of these trees and notify the Forest Silviculturist.

OLD GROWTH

FW-85 During project planning, inventory any stands proposed for timber harvest for existing old growth conditions using the criteria in Appendix B (*Guidance for Conserving and Restoring Old Growth Forest Communities on National Forests in the Southern Region* (Forestry Report R8-FR 62, June 1997)). Any stands in Old Growth Forest Types 1 (Northern Hardwood), 2a (Hemlock-Northern Hardwood), 2b (White Pine-Northern Hardwood), 2c (Spruce Northern Hardwood), 5 (Mixed Mesophytic), 10 (Hardwood Wetland Forests), 22 (Dry and Xeric Oak Forest), 24 (Xeric Pine and Pine-Oak Forest and Woodland), 28 (Eastern Riverfront) that meet the age criteria for old growth will be unsuitable for timber production, regardless of whether they meet the other criteria for existing old growth. Stands in Old Growth Forest Types 21 (Dry Mesic Oak) or 25 (Dry & Dry-Mesic Oak-Pine) may be suitable for timber harvest. Decisions to harvest these stands would be made after consideration of the contribution of identified patches to the distribution and abundance of the old growth community type and to the desired condition of the appropriate prescription during project analysis.

FOREST HEALTH

Gypsy Moth

FW-86 Integrated Pest Management is used to protect resources from damage caused by the gypsy moth.

FW-87 Suppression actions are allowed to reduce damage caused by outbreaks where gypsy moths are established as identified by the entomologists with the Forest Health Protection Unit of the Forest Service. Suppression treatments available for use in gypsy moth suppression include, but are not limited to, the bacterial insecticide *Bacillus thuringiensis* var. *kurstaki*, the chemical insect growth regulator diflubenzuron, and the gypsy moth specific biological insecticide.

FW-88 The development, improvement, or testing of high population treatment tactics (insecticide application), low population treatment tactics (mating disruption, sterile insect release, fungal application, insecticide application, and mass trapping) and introduction of natural enemies may be considered in all forest areas except Wilderness and where indicated in specific management prescriptions.

Southern Pine Beetle

FW-89 Integrated Pest Management is used to prevent or control damage caused by the southern pine beetle.

FW-90 Use hazard rating models and silvicultural treatments to reduce risk of southern pine beetle infestation in pine forests.

Non-Native Invasive Plant Species

FW-91 The use of Category 1 Species (Regional list of species that are known to be invasive and persistent throughout all of most of their range) is prohibited.

FW-92 The establishment or encouragement of Category 2 Species (Regional list of species that are suspected to be invasive or are known to be invasive in limited areas) is prohibited in areas where ecological conditions would favor invasiveness and is discouraged elsewhere. Projects that use Category 2 Species should document why no other (non-invasive) species will serve the purpose and need.

FW-93 Favor use of native grasses and wildflowers beneficial as wildlife foods when seeding temporary roads, skid roads, log landings and other temporary openings when slopes are less than 5%. On slopes greater than 5%, favor use of vegetation that best controls erosion.

FW-94 Planning for management activities includes consideration of existing and potential non-native invasive plant (NNIP) threats. Site-specific plans should include control/eradication treatments and follow up monitoring of those treatments for effectiveness. Examples include inventory and treatment of log landing and haul road sites for timber sales, fire control lines (particularly those with soil disturbance), areas near existing seed sources for prescribed burns, and trail corridors for trail construction.

FW-95 A contractor's sources of fill, soil, shale, and related materials will be pre-approved. Contractors will submit a description of the source. The project inspector or a qualified designee will inspect the supply source. Use of the source will be prohibited if contaminated by transferable agents of invasive species.

FW-96 Forest sources of fill, borrow or road surfacing material will be examined for NNIPs and treated as necessary to prevent transfer of invasive plants to other parts of the Forest.

FW-97 Mechanical equipment, such as that used for logging, mowing, firefighting and earth moving (including road graders), should be free of soil, seeds, and other attached material prior to coming on the Forest or being moved from areas on the Forest with NNIP infestations to areas free from noticeable infestations. Such equipment should be examined by qualified Forest Service personnel before being allowed on the Forest.

FW-98 Personnel treating NNIP infestations will take appropriate measures to prevent transporting seeds or other propagules to other sites. Such measures may include cleaning equipment at the treatment site after treatment, bagging the equipment until such time that it can be cleaned (e.g. hand sprayers), removing and bagging outer garments after treatment, brushing clothing and boots thoroughly before departing the treatment site.

FW-99 Fueling or oiling of mechanical equipment will occur away from aquatic habitat.

FW-100 When NNIP control work is conducted in areas containing TESLR plant species, those plants will be flagged, marked or identified for applicators to avoid spraying. A physical barrier will be used to protect non-target species when they occur immediately adjacent to the treatment area.

Pesticides

FW-101 Application is supervised by a certified pesticide applicator. Workers who apply pesticides are trained to ensure minimum impacts and maximum effectiveness. Only those methods that assure proper application of pesticides are used.

INSECTICIDES

FW-102 Insecticides known to have negative impacts on aquatic ecosystems are not aerially applied within 200 feet of perennial streams, wetlands, or open bodies of water. The use of imidacloprid/insecticides for hemlock woolly adelgid may be ground applied only if: 1) they pose a low risk of soil movement and groundwater contamination; 2) only where there is enough soil and organic matter to prevent the chemical from moving; 3) in the case of soil injection, no injections deeper than the O/A horizon occur; 4) they are used at the lowest effective rate; and 5) the soil is not saturated.

FW-103 A notice of intent to aerially apply insecticides or other aerially applied intervention tactics (e.g. pheromone flakes) is posted on signs prior to treatment. Signs are placed along roads and trails at major entry points to the treatment area. For wilderness areas, the notice of intent is placed outside the wilderness boundary at major trailheads. Wilderness areas have signs in place at least one week prior to treatment. Signs inform visitors of the type of intervention tactic and the time span in which application may occur, thus allowing visitors the option of minimizing or avoiding exposure to the treatment.

FW-104 Treatment of developed recreation areas such as picnic areas and campgrounds or dispersed areas of high concentrated use should be scheduled during low-use periods, or the areas are

temporarily closed in order to minimize human exposure to the treatment. Signs are posted in these areas at least 24 hours before treatment begins. Signs provide information on scheduled treatment dates and type of treatment.

FW-105 Treatment of dispersed recreation areas accessible by trails have signs posted at all major points of entry. Signs are in place at least 24 hours before treatment begins. The signs provide information on date and type of treatment in order to allow visitors to minimize or avoid exposure.

HERBICIDES

FW-106 Method and timing of application are chosen to achieve project objectives while minimizing effects on non-target vegetation and other environmental elements. Selective treatment is preferred over broadcast treatment. Application methods from most to least selective are:

- Cut surface treatments;
- Basal stem treatments;
- Directed foliar treatments;
- Soil spot (spot around) treatments;
- Soil spot (spot grid) treatments;
- Manual granular treatments;
- Manual/mechanical broadcast treatments;
- Helicopter treatments.

FW-107 Areas do not undergo prescribed burning for at least 30 days after herbicide treatment.

FW-108 Aerial application with herbicides is allowed only in utility corridors. Each aerial herbicide application must have an operations plan to ensure that:

- Adequate precautions are taken to protect the crew, including equipment certification and hazard identification;
- Areas to be aerially treated are clearly marked; and
- Methods used to avoid buffers and other sensitive areas are safe and effective.

FW-109 No herbicide is aerially applied within 200 horizontal feet of an open road or designated trail. Buffers are clearly marked before treatment so applicators can easily see and avoid them.

FW-110 No herbicide is aerially applied within 300 feet, nor ground-applied within 60 feet, of any known threatened, endangered, proposed, or sensitive plant, except where its use is necessary to control non-native invasive species affecting federally listed or sensitive species. Buffers are clearly marked before treatment so applicators can easily see and avoid them.

FW-111 No herbicide is aerially applied within 200 horizontal feet, nor ground-applied within 30 horizontal feet, of lakes, wetlands, perennial or intermittent springs and streams. No herbicide is 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 pesticides) may occur within these buffers only to prevent significant environmental damage such as non-native invasive plant infestations. Buffers are clearly marked before treatment, so applicators can easily see and avoid them.

FW-112 With the exception of utility corridor and road rights-of-way, no herbicide is broadcast within 100 feet of private land or 300 feet of a private residence, unless agreed to by the landowner. Buffers are clearly marked so applicators can easily see and avoid them.

FW-113 When applying herbicide, protect non-target vegetation, especially threatened, endangered, proposed, or sensitive plants by employing a physical barrier between them and the area being treated. The physical barrier must be sufficient to protect the non-target vegetation from herbicide drift and flow.

FW-114 Aquifers and public water sources are identified and protected.

FW-115 Application equipment, empty herbicide containers, clothes worn during treatment, and skin are not cleaned in open water or wells. Mixing and cleaning water must come from a public water supply and be transported in separate labeled containers.

FW-116 Herbicide mixing, loading, or cleaning areas in the field are not located within 200 feet of private land, riparian corridors, open water or wells, or other sensitive areas.

FW-117 Only stem-specific treatments should be done on rock outcrops or sinkholes. No soil-active herbicide with a half-life longer than 3 months should be broadcast on slopes over 45 percent or on aquifer recharge zones. Such areas should be clearly marked before treatment so applicators can easily see and avoid them.

FW-118 Weather is monitored and the project is suspended if temperature, humidity, or wind becomes unfavorable as shown in Table 4-1.

Table 4-1. Unacceptable Weather Conditions for Herbicide Application

	Temps Higher Than	Humidity Less Than	Wind (at Target) Greater Than
Hand (cut surface)	N.A.	N.A.	N.A.
Hand (other)	98°F	20%	15 mph
Mechanical (liquid)	95°F	30%	10 mph
Mechanical (granular)	N.A.	N.A.	10 mph
Aerial (granular)	N.A.	N.A.	8 mph

FW-119 Nozzles that produce large droplets (mean droplet size of 50 microns or larger) or streams of herbicide are used. Nozzles that produce fine droplets are used only for hand treatment where distance from nozzle to target does not exceed 8 feet.

FW-120 Herbicides should be applied at the lowest rate effective in meeting project purposes and according to guidelines for protecting human (NRC 1983) and wildlife health (EPA 1986a). Application rate and work time should not exceed levels that pose an unacceptable level of risk to human or wildlife health. If the rate or exposure time being evaluated causes the Margin of Safety or the Hazard Quotient computed for a proposed treatment to fail to achieve the current Forest Service R-8 standard for acceptability (acceptability requires a MOS > 100 or, a HQ of <= 1.0 depending on the methodology employed in the risk assessment to reflect potential risk), additional risk management is to be undertaken to reduce unacceptable risks to acceptable levels or an alternative method of treatment should be used. At present the most current FS risk assessments (found on the WO website; produced for the FS by Syracuse Environmental Research Associates (SERA)) employ HQ so the standard is <= 1.0. Should contractor or methodology change during this planning period, an at least equally restrictive standard should be imposed to define acceptable risk.

Timber Management

SALVAGE

FW-121 The maximum size of openings allowed for harvesting timber as a result of fire, wind, ice, snow, and insect attacks will be determined on a case-by-case basis.

FW-122 There are no dispersion requirements for salvage treatment areas.

FW-123 When leaving a partial forest canopy during a salvage operation resulting from a forest pest (e.g. gypsy moth or southern pine beetle), tree species susceptible to that pest should not be retained.

FW-124 In order to favor desirable species, consider post-harvest salvage treatments on lands suitable for timber harvest with site index 70+, including:

- Installation of tree shelters on existing advanced reproduction of hardwood species.
- Planting of hardwood species at approximately 45 feet spacing (22 trees per acre) where natural advanced reproduction is inadequate.
- Release of trees in tree shelters from competing vegetation.

HARVESTING METHODS

FW-125 Use advanced harvesting methods (such as cable or helicopter) on sustained slopes 35 percent or greater to avoid adverse impacts to the soil and water resources.

ROTATIONS

FW-126 The following rotation ages are specified for lands that are suitable for timber production.

Table 4-2. Rotation Ages

Working Group	Rotation Age
Upland hardwoods	80-180
Cove hardwoods	70-180
White pine	60-100
Yellow pine	60-100
Scarlet oak/Black oak	60-100

FW-127 Allow harvesting of trees prior to rotation age during the first cutting cycle in order to meet long-term desired condition of a particular management prescription. Regeneration harvesting cuts are not scheduled prior to culmination of mean annual increment (CMAI) as indicated in Table 4-3.

Table 4-3. Working Groups CMAI Ages

Working Group	CMAI Age
White Pine	55
Cove Hardwoods	50
Upland Hardwoods	65
Southern Yellow Pine	45

EVEN-AGED AND TWO-AGED MANAGEMENT

FW-128 The maximum size of an opening created by even-aged or two-aged regeneration cutting is 40 acres. Exceptions to these acreage limitations may be permitted following review by the Regional Forester. These acreage limits do not apply to areas treated because of natural catastrophic conditions such as fire, insect or disease attack, or windstorm. Areas managed as permanent openings (e.g. meadows, old fields, wildlife openings, roads, and utility corridors) are not subject to these standards and are not included in calculations of opening size, even when within or adjacent to created openings.

FW-129 Separate even-aged or two-aged harvest units from each other by a minimum distance of 330 feet (5 chains). Such openings may be clustered closer than 330 feet as long as their combined acreage does not exceed the maximum opening size. An even-aged regeneration area will no longer be considered an opening when the certified reestablished stand has reached an age of 5 years.

FW-130 Even-aged or two-aged regeneration cutting may be scheduled next to uneven-aged stands at any time.

REGENERATION HARVESTS

FW-131 Regeneration cutting on lands suitable for timber production must be done under a regeneration harvest method where adequate stocking of desirable species is expected to occur within 5 years after the final harvest cut. The new stand must meet the minimum stocking levels as described below. These apply to both artificial and natural means of stand regeneration. Where natural means are used and stand re-establishment has not been accomplished within 3 years after committing the stand to regeneration, the stand is re-examined for further treatment needs.

Table 4-4. Stocking Levels

Forest Type	Number of Stems Per Acre[1]		
	Minimum Level	Desired Level	Maximum Level
White Pine	150	250 - 300	500
Mixed pine-hardwood	200	400 - 600	900
Hardwoods	150	250 - 300	500
Yellow Pine	300	500 – 700	900

[1]The levels are guides and are used in conjunction with professional judgment to determine acceptable restocking levels for a specific site.

FW-132 No heavy equipment is used for site preparation on sustained slopes over 35 percent.

UNEVEN-AGED MANAGEMENT

FW-133 Uneven-aged regeneration methods are limited to lands (except as noted below) that are at least 100 acres in size, with slopes less than 30 percent, and within ½ mile of existing roads. Uneven-aged harvest methods can occur on slopes steeper than 30 percent with low impact harvesting systems.

FW-134 Uneven-aged regeneration methods are allowed on lands other than listed in FW-133 when site-specific project objectives include canopy gap creation, scenic enhancement, or restoration/enhancement of old growth forest conditions.

FW-135 There are no dispersion requirements, as discussed in FW-129, for openings created by uneven-aged regeneration methods. Cutting cycles will vary from 5-20 years depending upon management objectives.

FW-136 The maximum size limit of group selection openings is 2 acres.

NON-TIMBER FOREST PRODUCTS

FW-137 Unless specifically designated on use permits, collection of non-timber forest products (other than fuelwood) is prohibited within 100 feet of roads and trails in order to disperse collection impacts. Cutting of dead or down trees by personal use permit for fuelwood purposes is allowed Forestwide from existing roads, except where prohibited by management prescription direction or prohibited by the use permit.

FW-138 Collection of botanical products is subject to the following restrictions:

- Collection of threatened, endangered, sensitive or locally rare species is not permitted except for research purposes.
- Commercial moss collection is prohibited.
- Collection of ginseng and golden seal is prohibited.
- Collection within 50 feet of a perennial or intermittent stream is limited to those species that cannot be feasibly collected on upland sites (i.e., no collection of *Rhododendron* is allowed within riparian areas because it can be collected on upland sites.)
- For ground disturbing activities (transplants, root digging, etc.) a maximum of 10 plants will be allowed per permit, with no more than one permit sold to an individual per month.
- Non-destructive collection activities (fruits, seed collection, cuttings, etc.) are allowed for species other than threatened, endangered, sensitive or locally rare species.

LOG LANDINGS AND SKID TRAILS

FW-139 Log landings will be located outside of riparian corridors.

FW-140 All equipment used for harvesting and hauling operations will be serviced outside of riparian corridors.

FW-141 When necessary, landings will be ripped to a depth of 6-8 inches to break up compaction, and to ensure soil productivity and the successful reestablishment of vegetation.

FW-142 Skid trails may cross riparian corridors at designated crossings. If crossing a perennial or intermittent stream is unavoidable, use a temporary bridge or other approved method within the State Best Management Practices (BMPs). All streams are crossed at as close to a right angle as possible. Stabilization of skid trails will occur as soon as possible to minimize soil movement downslope.

FW-143 Skidding of trees should be directed in a manner that prevents creation of channels or gullies that concentrate water flow to adjacent streams.

FW-144 Temporary stream crossings will be removed and rehabilitated.

FW-145 Dips or waterbars or other dispersal methods will be constructed and maintained to direct stormwater off skid trails and reduce potential sediment flow to streams.

FW-146 Designated trails will not be used as skid trails. Crossing of designated trails should be minimized and should occur at right angles to the extent feasible. Implement needed restorative measures to damaged trail tread and profile as soon as practicable upon completion of vegetation management activities.

Wildland Fire Management

FW-147 When used for control lines, trails (including tread, structures and improvements) will be restored to pre-burn conditions as soon as practicable.

FW-148 Fire control lines (whether constructed by hand or mechanically) that tie into travelways (trails, roads, etc.), will be obliterated and the topography restored to original contour as soon as possible following the fire.

WILDFIRES

FW-149 Ensure firefighter and public safety as the first priority. Secondly, protect property and natural and cultural resources based on the relative values to be protected.*)*

FW-150 Suppress human-caused wildfires (either accidental or arson).

FW-151 The full range of suppression tactics (from full suppression to monitoring) may be used, consistent with forest and management prescription area direction.

FW-152 Suppress wildfires at minimum cost, considering firefighter and public safety, benefits, and values to be protected, consistent with resource objectives.

FW-153 Where needed to prevent erosion, firelines are revegetated and water-barred promptly after the fire is controlled.

FW-154 Lightning-caused fires are allowed to play their natural ecological role as long as they occur within prescribed weather and fuel conditions and do not pose unmitigated threats to life and/or private property, particularly to that property within the wildland/urban interface zone.

PRESCRIBED FIRE

FW-155 Use existing barriers, e.g. streams, lakes, wetlands, roads, and trails, whenever possible to reduce the need for fireline construction and to minimize resource impacts.

FW-156 Best available smoke management practices will be used to minimize the adverse effects on public health, public safety and visibility in Class I areas (James River Face Wilderness and Shenandoah National Park) from prescribed fire.

FW-157 Conduct prescribed burning only if meteorological conditions ensure that smoke will be carried away from areas with a high forecasted Air Quality Index (Orange or higher).

FW-158 All managed burns will comply with Smoke Management Programs for Virginia and West Virginia, when these are implemented. (Per EPA's "Interim Air Quality Policy on Wildland and Prescribed Fires" which was developed with involvement of the USDA Forest Service).

FW-159 Identify caves or abandoned mines that contain significant populations of bats as smoke-sensitive targets. Avoid smoke entering these caves or mines when bats are hibernating (generally this is Nov 1 to April 1).

FW-160 Only conduct prescribed fires when weather and fuel conditions are within parameters established in Regional and Forest direction.

FW-161 Do not plan prescribed fires in mesic deciduous forest communities (northern hardwood, mixed mesophytic, and river floodplain hardwood) that do not contain a significant oak component. When practical and without resulting in increased fireline construction or jeopardizing firefighter safety, avoid burning these communities when implementing prescribed fires in adjacent forest communities.

FW-162 When necessary to include mesic deciduous forest communities within burning blocks, direct firing will not be done unless necessary to secure control lines. In these cases, allow low intensity fires. Exceptions are allowed when the fire is designed to encourage oak regeneration.

FW-163 Maintain and restore table mountain pine and pitch pine forests through prescribed fires that are moderate to high intensity with moderate severity fires.

OTHER FUELS TREATMENT

FW-164 Only mowing, chopping, or shearing treatments are used on sustained slopes over 15 percent. No heavy equipment is used for mechanical fuels treatments on sustained slopes over 35 percent.

Recreation

DEVELOPED RECREATION

FW-165 New campsites and restrooms will be located outside of the 100-year floodplain. When replacing or rehabilitating existing facilities, consider the feasibility of relocation outside of the floodplain.

FW-166 As appropriate for the ROS class and development scale, post applicable public safety and resource protection messages on-site. Examples of messages include Flash Flood Hazard, Bear Aware and/or Safe Camping in Bear Country, Boating Safety, Swimming Safety, Don't Move Firewood (emerald ash borer), and Stop Aquatic Hitchhikers.

TRAILS

FW-167 The Appalachian National Scenic Trail standards are addressed in the standards for Management Prescription Area 4A.

FW-168 Trails are closed to motorized recreation use unless designated otherwise.

FW-169 Motorized use of the trail system is permissible for administrative purposes, emergencies, and at road crossings, when the trail is specifically designated for motorized use, or when the trail is on or coincident with an open public road.

FW-170 Any new trail construction or reconstruction is carefully located to avoid impacts to threatened, endangered, sensitive, or locally rare species habitat, cultural resources, and to be physically and environmentally sustainable.

FW-171 Management activities along system trails shall be implemented with sensitivity to the experience of the users. Appropriate techniques to mitigate the effects of management activities are addressed during site-specific project analysis. Measures to mitigate the effects of activities might include vegetative screening; the temporary re-routing of trail segments; temporary trail closure, avoidance and reclamation; and timing of project implementation to reduce impacts during high use periods.

FW-172 If unacceptable resource damage is identified, that section of the trail will be closed, and be re-routed if possible, until the damage is repaired. Trail could be permanently closed if necessary.

RECREATION OPPORTUNITY SPECTRUM

FW-173 Maintain existing roads and motorized trails within semi-primitive motorized areas to a standard necessary to protect soil, water, and biological resources while maintaining an off-highway type recreation experience.

OFF-HIGHWAY VEHICLES (OHVs) AND ALL-TERRAIN VEHICLES (ATVs)

FW-174 ATV trail systems are managed under Management Prescription 7C.

FW-175 OHV use on open public roads is limited to licensed vehicles and operators that comply with motor vehicle laws of the state.

FW-176 The national forest's Motor Vehicle Use Map (MVUM) contains a list of the types of vehicles allowed on each designated road, trail and area and any seasonal restrictions that apply on those routes and in those areas.

FW-177 ATVs are restricted to routes (roads and trails) specifically designated as open to such vehicles.

FW-178 Cross-country motorized use, off open and designated roads and trails, is prohibited except in the case of emergency, e.g. wildland fire or search and rescue.

FW-179 Improving and expanding existing ATV trails is given priority consideration over designating new areas.

FW-180 ATV routes are preferred that can provide a two-hour or longer riding experience and that have looping characteristics or are a part of a larger transportation system.

WILD & SCENIC RIVER MANAGEMENT

See Management Prescription Areas 2C2 and 2C3. Segment A of St. Mary's River (see Appendix D) lies within the St. Mary's Wilderness and is eligible for the National Wild and Scenic River System as a wild river. This segment is allocated to management prescription area 1A-Wilderness since this prescription protects the qualifying characteristics of a wild river.

Scenery

FW-181 The Scenery Management System guides protection and enhancement of scenery on the George Washington National Forest. The Scenic Class inventory (including Landscape Visibility, Concern Level, and Scenic Attractiveness) is maintained, refined, and updated as a result of site specific project analysis. The Standards under each management prescription area refer to Scenic Class inventory as updated.

FW-182 The Forest Scenic Integrity Objectives (SIOs) are met for all new projects (including special uses). Existing conditions may not currently meet the assigned SIO.

FW-183 Lands mapped as Concern Level 1 middleground from travelways (see Glossary) and use areas will be inventoried as Scenic Class 2 or higher and will be managed for an SIO of Moderate or higher.

FW-184 Shape and orient vegetative management openings in the forest canopy to contours and existing vegetation patterns to blend with existing landscape characteristics. Shape and feather edges in High and Moderate SIO areas. Some edges may not need feathering to meet the SIO. Do not use geometric shapes.

FW-185 Apply leave tree and unit markings to not be visible within 100 feet of Concern Level 1 and 2 travelways and use areas.

FW-186 Remove, burn, chip or lop slash when visible within a 100-foot zone of Concern Level 1 & 2 travelways and use areas. These treatments result in an average slash height of 2 feet of the ground.

FW-187 Design and construct roads to blend with the desired landscape character in form, line, color and texture.

FW-188 During temporary or permanent road construction, eliminate or remove from view, slash and root wads as viewed from the immediate foreground of High and Moderate SIO viewing platforms to the extent possible. Some slash may be aligned parallel to roads at the base of fill slopes to collect silt.

FW-189 During vegetative management activities, remove or place out of sight root wads and other unnecessary debris within 150 feet of key observation points on Concern Level 1 and 2 travelways and use areas.

FW-190 Locate log landings, roads and bladed skid trails out of view to avoid bare mineral soil observation from Concern Level 1 travel routes and viewing platforms.

FW-191 Exclude gravel pits and borrow areas from the foreground of Concern Level 1 travelways and use areas.

FW-192 In Very High and High SIO areas, accomplish mowing or bush hogging as soon as practicable following plant mortality resulting from roadside herbicide treatment.

FW-193 Structures have finishes that reduce contrast with the desired landscape character.

FW-194 Selectively remove trees where outstanding views can be revealed at high use areas, vista points, and along interpretive trails.

FW-195 During vegetative management activities, when consistent with other objectives, favor flowering and other visually attractive trees and understory shrubs when leaving vegetation.

FW-196 Favor 14 inch and larger trees in a mixture with other smaller sized tree stems when creating spatial diversity along travelways and in recreation use areas. Provide a range of tree diameters.

FW-197 When engaged in scenery enhancement activities, introduce or favor native wildflowers, shrubs, trees with showy flowers, fall foliage, and fruits.

FW-198 Within the landscape's historic range of variability, prescribed fire is allowed to mimic natural wildfires to restore a historic landscape character that includes a mosaic of closed and open canopy forest, open woodlands, and grasslands/shrublands. Elements that are not natural appearing and that would not be evident following a natural wildfire, such as constructed firelines and wood piles or other residue remaining from fire preparation:

- do not remain visually evident for more than one year in areas with Scenic Integrity Objectives (SIOs) of Very High and High;
- may remain visually evident but appear as minor disturbances that are subordinate to the valued landscape scenery within three years in areas with a SIO of Moderate; and
- may remain visually evident in areas with a SIO of Low, but appear as a moderate alteration to the valued landscape scenery by borrowing from line, form, color, texture, pattern or other attributes found in similar land types outside of the scenery being viewed.

Cultural Resources

FW-199 Coordinate inventory, evaluation, nomination, protection, enhancement, and interpretation procedures with the appropriate State Historic Preservation Officer (SHPO), Advisory Council on Historic Preservation (ACHP), and Tribal Historic Preservation Officer (THPO) as necessary before project decisions.

FW-200 Projects are 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.

FW-201 Evaluations are scheduled and conducted if a project would have any effect on a cultural resource potentially eligible for the National Register of Historic Places. Evaluations are scheduled and conducted if the responsible official and State Heritage Preservation Office (SHPO) disagree on whether a heritage resource is potentially eligible for the National Register of Historic Places.

FW-202 Decision documents (Record of Decision, Decision Notice or Decision Memo) will evidence compliance with the NHPA, 36 CFR 800, and other cultural resource-related federal laws and regulations, as appropriate. A project (or undertaking) not in compliance will be suspended by the Forest Supervisor until compliance is documented.

FW-203 A consultation with the SHPO is in order when it is determined that the project would affect an eligible site, and the project cannot be relocated or modified to avoid the site.

FW-204 Consultation will include, when necessary, federally recognized Native American Indian tribes with geographic or cultural ties to the Forest, pursuant to provision in the Archeological Resources Protection Act (ARPA), National Historic Preservation Act (NHPA), American Indian Religious Freedom Act (AIRFA), and the Native American Graves Protection and Repatriation Act (NAGPRA). Forest Heritage staff will develop mechanisms for consultation. Provide for traditional use or collection of forest resources by Native American Indians pursuant to provision in the Food, Conservation and Energy Act of 2008.

FW-205 A Section 106 Memorandum of Agreement (MOA) will be negotiated with the SHPO, ACHP, and federally recognized Native American Indian Tribes with ancestral connections to the area and

implemented in those situations where a cultural resource that is eligible for or included in the National Register of Historic Places cannot be avoided and will be adversely affected by a proposed project per 36 CFR 800.5 and 36 CFR 800.6.

FW-206 Ensure that Section 106 compliance clauses are inserted in contracts and sales documents, and those clauses are discussed in pre-work conferences.

FW-207 If additional evidence or information regarding a "not significant" property becomes available, it will be re-evaluated.

Rangeland Resources

FW-208 Where rangeland facilities or practices are identified as contributing to the degradation of water quality, aquatic species, scenic resources, rare communities, or federally listed or sensitive species habitat, remedial actions may include changes in management strategy, alteration, temporary closure, relocation, or discontinuance of the permit.

Minerals and Geologic Resources

GEOLOGIC RESOURCES

FW-209 Locate and design facilities and management activities to avoid, minimize, or mitigate negative effects on geologic resources with identified values (scientific, scenic, paleontological, ecological, recreational, drinking water, etc.).

FW-210 Identify, using the appropriate type and scale of geologic mapping, the geologic components (processes, structures, materials, and landforms) relevant to proposed projects, and integrate the components into: 1) siting and design of the project; 2) restoration; 3) ecological sustainability; and 4) environmental analysis.

FW-211 Locate and design projects to minimize potential adverse effects on groundwater and groundwater dependent ecosystems. In karst areas, integrate geologic assessment in project design and monitoring.

GEOLOGIC HAZARDS

FW-212 Locate, design, and maintain trails, roads, other facilities, and management activities to avoid, minimize, or mitigate geologic hazards and potential impact on infrastructure and public safety. Site characterization prior to ground disturbance on slope gradients of 40% or greater will: 1) identify existing geologic slope stability conditions; 2) evaluate how construction would alter the existing conditions; and 3) assess potential for slope failures (from cut slopes, fill slopes, disposal sites for excess excavation, and sidecast material). For ground-disturbing projects on slope gradients of 40% or greater located upslope and within one-half mile of Forest external boundary, consider a geologic hazard and risk assessment of off-Forest public safety for landslides, including debris flows.

FEDERAL LEASABLE MINERALS - GENERAL

FW-213 Following exploration and production operations, the permittee is responsible for reclaiming disturbed sites in accordance with an approved reclamation plan. Reclamation shall meet the requirements of 36 CFR 228. Plans will consider opportunities to enhance the desired condition of the particular management prescription.

FEDERAL LEASABLE MINERALS - OIL AND GAS

FW-214 Lands that are available for leasing (existing leased lands or lands that become available in the future) are available under standard lease terms and conditions, unless additional stipulation(s) are specified by the individual management prescription or by the decision on lands administratively available for oil and gas leasing.

FW-215 Operations will comply with environmental protection standards from several sources: Forest Plan standards for the management prescription where the operations will occur; lease terms and conditions; federal Onshore Oil and Gas Orders; Oil and Gas Resources regulations (36 CFR228 E); Conditions of Approval in Applications for Permits to Drill; and Federal and State regulations to protect soil, surface water, groundwater, riparian, and aquatic resources and to reclaim areas affected by oil and gas activities.

FW–216 The Forest Service will only approve Surface Use Plans of Operations associated with Applications for Permit to Drill that contain the following provisions:

1) Water will not be withdrawn from surface water or groundwater sources on the Forest unless a qualified Forest Service employee determines that this withdrawal will result in less overall environmental impacts than the impacts of not withdrawing the water;
2) Only closed loop systems will be used for hydraulic fracturing;
3) Drill cuttings will be removed from the drill site and disposed of at approved sites off the Forest, unless authorized by a qualified Forest Service employee;
4) Secondary containment infrastructure will be used at the site to reduce impacts from stormflow or spills;
5) No surface disposal of flowback water or produced waters will be allowed on National Forest System lands;
6) Non-native invasive species occurring at the site of new openings constructed in association with drilling activities will be treated as long as the well is under lease.

FW-217 Generally pipelines associated with development of natural gas resources will be constructed within road corridors.

FEDERAL LEASABLE MINERALS - OTHER THAN OIL AND GAS

FW-218 When not specifically noted in the individual management prescription as congressionally withdrawn or administratively unavailable, other Federal leasable minerals are available.

FEDERAL LEASABLE MINERALS - COAL

FW-219 Operations will follow Federal and State regulations to protect soil, surface water, groundwater, riparian, and aquatic resources and values; and to reclaim areas affected by mining activities.

MINERAL MATERIALS

FW-220 Mineral materials (36 CFR 228c) are available for commercial, personal, free, and administrative uses.

ROCK, MINERAL, AND FOSSIL COLLECTION

FW-221 Except for archaeological sites, caves, or in Wilderness, the public can collect small quantities of rocks, minerals, and invertebrate fossils for non-commercial purposes (scientific, educational, and recreational, including recreational gold panning). If such activities would involve motorized excavation equipment or significant disturbance, then a Permit would be required. Collecting for commercial purposes requires a Permit.

RESERVED AND OUTSTANDING MINERALS

FW-222 The exercise of outstanding rights shall be in accordance with terms of the deed of separation, as well as applicable State and Federal laws and regulations.

FW-223 The exercise of reserved rights shall be in accordance with the deed, the Secretary of Agriculture's rules and regulations within the deed, and applicable State and Federal laws.

FW-224 The Forest Plan, including management prescriptions and forestwide direction, is subject to outstanding and reserved mineral rights. Priorities to acquire private mineral rights through purchase, exchange or donation are in the following areas: designated Wilderness; designated Wild and Scenic Rivers; and Special Biological Areas. Until such private rights are acquired, the exercise of reserved and outstanding mineral rights to explore and develop mineral resources will be respected.

FW-225 All projects (including special designations, grants and agreements, special uses, and interagency agreements) or consideration of special designations shall include a review of the status of private mineral rights. Where private rights could be negatively affected, the public involvement process will inform and seek comments from the current owners of private mineral rights. The potential effects on private mineral rights will be assessed.

FW-226 Where reserved or outstanding mineral rights are involved, the mineral owner is encouraged to implement all surface-disturbing activities outside riparian areas.

Infrastructure

FACILITIES, ROADS AND ACCESS

FW-227 All existing open roads and trails should remain open for public travel unless any of the following occurs:

- Use causes unacceptable resource damage;
- The road or trail is unsafe for public use;
- Use conflicts with management prescription or forestwide direction;
- Closures or restrictions are needed to meet other resource needs;
- Funds are insufficient and are expected to remain insufficient for the foreseeable future to maintain the road or trail to meet standards commensurate with Objective Maintenance Level;
- Low use makes it an impractical or unreasonable investment for continued maintenance; or
- Public right-of-way does not exist.

FW-228 New construction of local roads is managed as closed to public use unless the following conditions are met:

- Use is compatible with the recreation opportunity for the area;
- Public safety is provided for;
- Road serves an identified public need;
- The area accessed by the road and associated uses can be managed in accordance with management prescription and forestwide direction considering available financial and personnel resources; or
- Funds are available for maintenance, or cost-sharing or volunteer maintenance can be arranged.

FW-229 Roads are seasonally or temporarily closed to motorized public use if there is a temporary or recurring need to:

- Prevent unacceptable resource damage;
- Prevent conflicts with the recreational opportunity established for the area;
- Protect property or public safety during resource management activities;

- The facility serves a seasonal or temporary management objective; or
- Reduce the need for additional maintenance associated with damage to the roadbed and/or surface that might occur during adverse weather or seasonal conditions.

ROAD CONSTRUCTION

FW-230 Roads are designed and constructed to the standard necessary to provide access and manage resources according to management prescription desired conditions and public safety.

FW-231 Revegetate during seeding seasons on construction sites where slopes are greater than 5%.

FW-232 All new and reconstructed roads will blend into the landscape to the extent practical.

ROAD MAINTENANCE

FW-233 Maintenance, reconstruction to a higher standard, or relocation of an existing road is allowed to reduce environmental damage, to improve user safety, or where agreed, to be turned over to the State.

FW-234 Apply the level of maintenance needed to protect the investment, facilitate resource management, and provide for user safety.

ROAD DECOMMISSIONING

FW-235 Closed system roads are planted with native or desirable non-native wildflowers, forbs, shrubs, and/or grasses.

FW-236 Closed system roads and wildlife linear strips may continue to be used for administrative and emergency access.

FACILITIES

FW-237 Design and maintain facilities to incorporate the principles of sustainability, reflect their place within the natural and cultural landscape, and provide optimal service to customers and cooperators.

FW-238 Before old buildings and other man-made structures are structurally modified or demolished, they will be surveyed for bats. If significant bat roosting is found, maintain these structures or provide alternate roosts suitable for the species and colony size prior to building modification or destruction.

Lands and Special Uses

SPECIAL USE AUTHORIZATIONS

FW-239 Evaluate new special use authorizations using the criteria outlined in 36 CFR 251.54 and according to Forest Service policy. Limit to needs that cannot be reasonably met on non-NFS lands or that enhance programs and activities. Locate uses where they minimize the need for additional designated sites and best serve their intended purpose. Require joint use on land when feasible.

FW-240 Do not allow recreation residences.

FW-241 Do not authorize new individual well/spring permits. Phase out existing uses when possible, as this is usually a need that can be met on private land.

FW-242 During evaluation of any proposals for wind energy development, the most current U.S. Fish and Wildlife Service land-based wind energy guidelines will be used to assess impacts to threatened or endangered species.

LINEAR RIGHTS-OF-WAY AND COMMUNICATION SITES

FW-243 Develop and use existing corridors and sites to their greatest potential in order to reduce the need for additional commitment of lands for these uses. When feasible, expansion of existing corridors and sites is preferable to designating new sites.

FW-244 Following evaluation of the above criteria, decisions for new authorizations outside of existing corridors and designated communication sites will include an amendment to the Forest Plan designating them as Management Prescription Area 5B or 5C.

FW-245 Design new towers and ridge top developments to mitigate collision impacts to migratory birds through coordination of project planning and implementation with the U.S. Fish and Wildlife Service.

FW-246 Locate new communications equipment on existing towers or other structures where possible. Where new tower construction is unavoidable, structures will use minimum safety lights required by the Federal Aviation Administration, daytime visual markers on guy wires, and down-shielded security lighting. At sites that do not currently have towers in excess of 199 feet or those that require lighting, height of new towers will not exceed 199 feet above ground level and/or exceed the height at which the FAA requires that the tower has lighting.

FW-247 Require holders of communication use authorizations to remove communications towers no longer in use or determined to be obsolete.

FW-248 Specify management requirements for permittee access roads in the designated use permit, where roads are included in the authorization.

FW-249 Place distribution lines for utilities underground, unless the environmental impacts of doing so exceed those of placing them above ground.

LAND ADJUSTMENT

FW-250 Land acquisitions will be guided by the following criteria:

Priority Acquisitions: (in order of priority)

1. Lands needed for the protection of federally listed endangered or threatened fish, wildlife, or plant species.
2. 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.
3. Lands within congressionally-designated wilderness boundaries.
4. Lands that provide an unbroken public right-of-way for the Appalachian National Scenic Trail consistent with the current policy statement for Appalachian Trail acquisition.
5. Lands needed for protection and management of congressionally-designated areas, including wilderness.
6. Environmentally sensitive lands such as rare communities, wetlands and old growth.
7. Lands that promote more effective management of the ecosystem and reduce administrative expenses through consolidation of national forest system ownership.
8. Lands that enhance recreation opportunities, public access, and protection of aesthetic values.
9. Lands needed to enhance or protect watershed improvements that affect the management of national forest riparian areas.
10. Consolidation of split estates.

FW-251 When compatible, manage new land acquisitions according to the adjacent or surrounding management prescription(s). When not compatible, conduct an environmental analysis and prepare the appropriate decision document to amend the Forest Plan.

FW-252 Land conveyances will be guided by the following criteria.

1. Lands inside or adjacent to communities or intensively developed private land, and chiefly valuable for non-National Forest System purposes.
2. Parcels that will serve a greater public need in state, county, city, or other Federal agency ownership.
3. Inaccessible parcels isolated from other National Forest System lands. Parcels intermingled with private lands.
4. Parcels within major blocks of private land, the use of which is substantially for non-National Forest System purpose.
5. To support more efficient management, parcels having boundaries, or portions of boundaries, with inefficient configurations (projecting necks or long, narrow strips of land, etc.)
6. Parcels that have substantial structural improvements that are authorized under a special use permit/lease if overall goals and objectives can be met.

RIGHT-OF-WAY ACQUISITION

FW-253 Access should be acquired through purchase or exchange from other agencies, states, counties, and private interests to assure management objectives are met for all ownerships.

Safety

FW-254 Any commercial operator proposing to work under the following Forest Service issued authorizations or approvals (concessionaire permit, timber contract, range allotment, Surface Use Plan of Operation under an Application for Permit to Drill, special use permit) must, upon request, provide information about materials proposed to be brought onto, stored on, or left on National Forest System lands. This information would include Material Safety Data Sheets (MSDS) as well as identification of materials marked, labeled or placarded in accordance with the U. S. Department of Transportation's Hazardous Materials Regulations (49 CFR Parts 171 through 180). This requirement does not apply to building materials (such as wood, stone or asphalt) or fuel. Permittees are required to maintain Material Safety Data Sheets (MSDS) for any hazardous materials on site. For material exceeding 1,000 gallons (or equivalent volume) in quantity, the permittee must also identify the proposed routes for entry and egress from the National Forest.

Implementation

FW-255 Project decisions made before the effective date of this plan (pursuant to the 1993 Revised Plan, as amended) that are not fully implemented before the effective date of this plan, shall adhere to the management requirements established in their original decision documents and the standards outlined in the 1993 Revised Plan, as amended. Project decisions made after the effective date of this plan shall adhere to the standards outlined in this plan.

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MANAGEMENT PRESCRIPTION AREAS

1A - DESIGNATED WILDERNESS

There are six congressionally-designated Wildernesses that lie wholly within the GWNF. The small portions of Barbours Creek and Shawvers Run Wildernesses that lie within the GWNF are managed under the Final Revised Jefferson Forest Plan. The existing Wildernesses on the Forest total about 43,000 acres.

Table 4-5. Wilderness within the GWNF

Name	Acres	Year of Designation
Priest	5,963	2000
Ramseys Draft	6,518	1984
Rich Hole	6,450	1988
Rough Mountain	9,300	1988
Saint Mary's	9,835	1984
Three Ridges	4,608	2000
Barbours Creek	20 (5,382 acres total; 5,362 acres are on Jefferson NF)	1988
Shawvers Run	95 (5,686 acres total; 5,591 acres are on Jefferson NF)	1988

EMPHASIS

The emphasis is to allow ecological and biological processes to progress naturally with little to no human influence or intervention, except the minimum impacts made by those who seek the wilderness as a special place offering opportunities to experience solitude and risk in as primitive surroundings possible.
The Wilderness Act of 1964 describes wilderness as "an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain. Wilderness is an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed to preserve its natural conditions. Wilderness generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable. It has outstanding opportunities for solitude or a primitive and unconfined type of recreation. It has at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition. And, it may also contain ecological, geological, or other features of scientific, educational, scenic, or historic value."

DESIRED CONDITIONS FOR 1A - DESIGNATED WILDERNESS

DC 1A-01: These areas retain a natural evolving landscape character shaped primarily by natural processes. These landscapes feature a structurally diverse older aged forest community with a continuous forested canopy, with the exception of gaps created by storms, insects, diseases, or fire. The valued character of these landscapes is intact with no deviations.

DC 1A-02: By the year 2064, visibility will return to natural conditions as mandated by EPA's Regional Haze Regulation and Clean Air Act Amendments of 1977. Land managers interact with regional consortia of states (e.g. Visibility Improvement States and Tribal Association of the Southeast) to improve visibility conditions. Visibility improves incrementally during this planning period as the Regional Haze Regulation is implemented (US EPA, 1997).

DC 1A-03: Natural processes will result in a large patch of late successional to old growth forest matrix. Rare communities and associated species will continue to exist. Natural disturbance events, such as insects and diseases, ice storms, and fire, play a major role in shaping future species composition and successional stages

across these areas. Non-native vegetation occurs only as transients and is not self-perpetuating. Cavity trees, cull trees, standing dead trees, and down logs are common throughout the area as a result of natural mortality.

DC 1A-04: Species associated with area-sensitive mid- to late-successional forest habitats are expected to inhabit this area. Management of the area is focused on protecting and preserving the natural environment from human influences. Timber harvest is not appropriate within this prescription area. Fire may be used to restore and maintain a historic fire regime as well as reduce the risks and consequences of wildland fire escaping from the area. Integrated pest management favoring biological controls may be used to eradicate or suppress non-native invasive pests. Non-commercial felling of trees with hand tools may be used to construct and maintain trails.

DC 1A-05: Recreation management is designed to provide solitude and remoteness in the most primitive and natural recreation setting possible. To this end, access to the area is limited. Trailheads at surrounding roads are designed with sensitivity to scale and character to set the tone for experiencing a primitive recreation experience. Once in the designated wilderness, visitors on foot or horseback must rely, to varying degrees, on their own personal physical abilities and primitive recreation skills. Wilderness recreation includes inherent risks. Visitors are isolated from the sights and sounds of others and encounters with other visitors are rare. Travel within wilderness is strictly non-motorized.

DC 1A-06: The Saint Mary's River and its tributaries are of sufficient quality to support the biota native to the streams. Until the impacts of acid deposition are negligible, the interim desired condition is that the pH and alkalinity of the streams are managed to reflect the natural conditions that would support the native biota.

DC 1A-07: Most visitor information is dispensed outside of the wilderness at trailheads and through off-site public information and education efforts. Wilderness visitors are encouraged to "pack-it-in and pack-it-out" and to "leave no trace." Wilderness trails lie lightly on the land, typically narrow footpaths or horse trails with minimum directional signing that blends well with the natural surroundings. Visitors are physically challenged as they ford streams and climb over downed trees.

DC 1A-08: Very few facilities are provided. Permanent human-made shelters may be present if they existed prior to wilderness designation, particularly along the Appalachian National Scenic Trail. Construction of new shelters on new sites within wilderness is not appropriate, unless there is an obvious and overriding need to protect the natural resources from visitor impacts. Structures including signs, bridges, waterbars, and constructed water sources for the comfort or convenience of visitors in wilderness are minimal. The few structures appearing in wilderness are generally for the protection of resources or were present prior to wilderness designation.

DC 1A-09: The Federal Government owns the lands within the boundaries of designated wilderness areas, both surface and subsurface, with no encumbrances.

STANDARDS FOR 1A - DESIGNATED WILDERNESS

General

1A-001 With the exception of wheelchairs, motorized transport and mechanized equipment are not allowed, except in emergencies. All such uses during emergencies require advance approval. See specific exceptions in the standards under Law Enforcement, Recreation and Forest Health.

Water, Soil, and Air

1A-002 Maintain soils in a natural undisturbed state, except for approved watershed restoration projects, wildland fire control measures, campsite rehabilitation, and trail construction, use, and maintenance. Favor natural healing of disturbed sites.

1A-003 Allow mitigation for acid rain and other pollution effects and evaluate on a case-by-case basis with appropriate line officer approval.

Terrestrial and Aquatic Species

1A-004 Existing old fields, wildlife openings, and other habitat improvements for fish and wildlife are not maintained, and succeed to forest, deteriorate over time, or are removed. New permanent wildlife openings are not created.

1A-005 Allow stocking only to reestablish or maintain indigenous, threatened, endangered, or sensitive species with appropriate line officer authorization.

Vegetation and Forest Health

1A-006 Forest insect and disease outbreaks are controlled only if necessary to prevent unacceptable damage to resources on adjacent land, prevent an unacceptable loss to the wilderness resource due to non-native pests, or protect threatened, endangered, and sensitive species.

1A-007 Use control measures that have the least adverse impact on the wilderness resource. Favor biological control methods.

1A-008 Actions to control insects and diseases may be approved by the Regional Forester under the following conditions:

- There is an immediate threat of unacceptable damage to resources outside the wilderness boundary and the threat cannot reasonably be abated by control actions taken outside the wilderness boundary; or
- There is an immediate threat of unnatural loss of the wilderness resource due to a non-native insect or disease.

1A-009 Eradicate non-native invasive plants when the infestations are isolated. Use hand-applied pesticides, with appropriate line officer approval, when necessary.

Timber Management

1A-010 These lands are classified as withdrawn from timber production. Timber harvest is not allowed.

Non-timber Forest Products

1A-011 Do not issue authorizations for the commercial use of any forest products.

1A-012 Allow personal-use collection of dead and down wood only for on-site campfire use.

1A-013 Allow personal-use collection of non-timber forest products (nuts, berries, pinecones, etc.), provided they are not threatened, endangered, sensitive or locally rare.

Wildland Fire Management

1A-014 Use Minimum Impact Suppression Tactics (MIST) which employ suppression methods and equipment that cause the least alteration of the wilderness landscape, least disturbance of the land surface, least disturbance to visitor solitude, least reduction of visibility during periods of visitor use, and least effects on air quality-related values.

1A-015 Wildland fire is allowed and managed to restore and maintain natural communities, to reduce a buildup of fuels to an acceptable level, and to decrease the risks and consequences of wildland fire escaping from wilderness.

1A-016 With the exception of firelines, only allow rehabilitation of a burned area if necessary to prevent an unacceptable loss of wilderness resources or to protect resources outside the wilderness. Revegetation work will use plant species native to the wilderness area.

Recreation

1A-017 Wilderness areas are managed for the Primitive Recreation Opportunity Spectrum (ROS) class although the inventoried ROS classes may range from Semi-Primitive Non-Motorized (SPNM) to Roaded Natural (RN).

1A-018 Construct, relocate, and maintain trails to the minimum standard necessary for protection of soil, water, vegetation, visual quality, user safety, and long-term maintenance. Trails are located to appear as part of the wilderness environment and not an intrusion upon it.

1A-019 Blazing of trails is allowed only on the Appalachian Trail.

1A-020 Use of hand-held power tools, like chainsaws, to reopen trails following catastrophic natural events may be authorized by the appropriate line officer.

1A-021 Minimize use of trail bridges or foot logs. Bridges are not installed for user convenience. Construct bridges if necessary for wilderness resource protection or for safety reasons. Design bridges to minimize impact on the wilderness resource. Select locations that minimize the size and complexity of the structure.

1A-022 Provide the minimum number of signs for the regulation or information of the user and the protection of the wilderness resource. Do not include distances to destination points on trail signs or directional arrows within the wilderness. Encourage use of trail maps.

1A-023 Groups entering the wilderness will not exceed 10 persons.

Appalachian National Scenic Trail

1A-024 Plan and carry out activities in cooperation with appropriate Appalachian Trail management partners.

1A-025 Horses and pack stock are prohibited on the Appalachian Trail footpath.

1A-026 Existing Appalachian Trail shelters and associated facilities may be maintained. When existing trail shelters deteriorate to the point that they must be replaced or reconstructed, analyze the shelter location. When possible, relocate shelters to appropriate sites outside of wilderness.

Scenery

1A-027 Management activities such as trail construction, maintenance, and signing are designed to meet a Very High Scenic Integrity Objective.

1A-028 Non-historical remnants such as old railroad ties and culverts causing unacceptable visual impact are removed.

Range

1A-029 Livestock grazing is not permitted unless specifically authorized in the designating legislation.

Minerals

1A-030 These areas are withdrawn from Federal oil and gas and other Federal mineral leases.

1A-031 These areas are not available for mineral materials for commercial, personal, or free use purposes. Administrative use of mineral materials is allowed when: a) the materials are used within the wilderness itself; and b) use is necessary to protect the wilderness resource.

1A-032 Requests for access to a non-Federal interest in lands pursuant to a reserved or outstanding right are recognized, and reasonable access is granted. Encourage such interests to minimize surface disturbances when possible. (See also forestwide standards under Lands).

Roads

1A-033 Do not permit road construction and reconstruction, subject to valid existing rights or leases.

1A-034 Favor natural revegetation of closed roads. Plant with native species only if the area is not expected to revegetate naturally in a reasonable time.

Lands and Special Uses

1A-035 Wilderness areas are not available for new special uses, except for research and outfitter-guide operations allowed under the Wilderness Act. Phase out existing non-conforming uses.

1A-036 Allow commercial use by outfitters and guides if compatible with preservation of the wilderness values. Do not allow contest events such as foot races or horseback endurance events. Require outfitters and guides to use leave-no-trace techniques. Do not allow permanent camps.

1A-037 Limit the size of commercial and organized groups to 10.

1A-038 These areas are unavailable for wind energy development.

Research and Monitoring

1A-039 Evaluate research proposals and scientific studies for which use of a wilderness is essential. Allow research that is compatible with wilderness management objectives.

1A-040 Allow collection of specimen plants for research with appropriate line officer authorization.

Law Enforcement and Search and Rescue

1A-041 The county or counties where the wilderness areas are located have the responsibility for search and rescue of lost or injured visitors. Forest personnel will provide assistance when requested for such things as scouting services, detailed maps, aerial photography, and detailed information about the area.

1A-042 Require appropriate line officer approval for motorized equipment for search-and-rescue and law enforcement operations within the wilderness area in advance. Use of motorized equipment is limited to emergencies involving inescapable urgency such as: (a) health and safety, (b) law enforcement involving serious crimes or fugitive pursuit, (c) removal of deceased persons, and (d) aircraft accident investigation.

1B - RECOMMENDED WILDERNESS STUDY AREAS

The areas that are recommended to Congress for wilderness study include two new areas and four additions to existing Wilderness that includes the following areas (as mapped): Little River (9,500 acres), Beech Lick Knob (5,700 acres), Rich Hole Addition (4,600 acres), Ramseys Draft Addition (6,100 acres), Rough Mountain Addition (1,000 acres), and Saint Mary's-West Addition (300 acres). The recommended wilderness study areas total about 27,000 acres. Where the boundary of one of these areas is coincident with a road, the boundary will be managed as a line 300 feet offset from state roads and 100 feet offset from Forest Roads to allow for road maintenance activities.

EMPHASIS

Pending legislation as to their classification, these areas are managed to protect the qualities that were the basis for recommending wilderness study, while also providing for existing uses where compatible with protecting wilderness character.

DESIRED CONDITIONS FOR 1B - RECOMMENDED WILDERNESS STUDY AREAS

DC 1B-01: Retain the remote natural evolving landscape character shaped primarily by natural processes. These landscapes feature a structurally diverse older aged forest community with a continuous forested canopy, with the exception of gaps created by storms, insects or disease. The forest includes fire-adapted communities.

DC 1B-02: Non-motorized recreation opportunities continue to be enjoyed, with an emphasis on retaining semi-primitive settings. Existing roads, trails, and wildlife improvements can be maintained using current practices. New facilities are not allowed. The area is a priority for road and facility decommissioning and soil and water improvements. Timber harvest is not appropriate within this prescription area.

STANDARDS FOR 1B - RECOMMENDED WILDERNESS STUDY AREAS

General

1B-001 Allow motorized equipment for the purpose of meeting prescription area objectives and removal of man-made elements not compatible with wilderness character prior to congressional designation as Wilderness.

Terrestrial and Aquatic Species

1B-002 Existing old fields, pastoral areas, wildlife openings, and other wildlife habitat improvements may be maintained. Expansion of existing openings and creation of new openings are not allowed.

Vegetation and Forest Health

1B-003 Allow control of insect and disease outbreaks when necessary to prevent a threat to adjacent property, to protect the scenic and recreational values, to reduce hazards to visitors, or for safety and legal reasons. 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.

1B-004 Tree cutting may occur incidental to other management activities such as trail construction, trail maintenance, removal of hazard trees, fireline construction, etc. Mechanical equipment such as chainsaws is permitted.

Timber Management

1B-005 These areas are classified as unsuitable for timber production.

Non-timber Forest Products

1B-006 Do not issue authorizations for the commercial use of any forest products.

1B-007 Allow personal-use collection of dead and down wood only for on-site campfire use.

1B-008 Allow personal-use collection of non-timber forest products (nuts, berries, pinecones, etc.), provided they are not threatened, endangered, sensitive or locally rare.

Wildland Fire Management

1B-009 Allow rehabilitation of firelines and the burned area to prevent an unacceptable loss of future wilderness resources or to protect resources outside the area. Revegetation work will use plant species native to the area. Evidence of firelines is obliterated as soon as practicable.

1B-010 Wildfires and prescribed fires are allowed to reduce a buildup of fuels, to restore native forest communities, to maintain threatened, endangered, sensitive, and locally rare species habitat, and to decrease the risks and consequences of wildland fire escaping from the area. With prescribed fires the use of natural fire breaks such as streams, roads, and bare areas is encouraged to minimize fireline construction.

Recreation

1B-011 Decommissioning of facilities that are not compatible with a wilderness designation is a priority.

1B-012 Recommended wilderness study areas are managed for the Primitive Recreation Opportunity Spectrum (ROS) class although inventoried ROS classes may range from Semi-Primitive Non-Motorized (SPNM) to Roaded Natural (RN).

1B-013 Construct, relocate, and maintain trails to the minimum standard necessary for protection of soil, water, vegetation, visual quality, user safety, and long-term maintenance. Emphasize trails that appear to be part of a wilderness environment and not an intrusion upon it.

1B-014 Minimize use of trail bridges or foot logs. Bridges are not installed for user convenience. Construct bridges if necessary for resource protection or for safety reasons. Design bridges to minimize impact on the wilderness resource. Select locations that minimize the size and complexity of the structure.

1B-015 Use of bicycles on existing trails can continue. Trails may be maintained but will not be improved to facilitate bicycle use.

Minerals

1B-016 These areas are not suitable for federal oil and gas and other federal mineral leases, pending final congressional action.

1B-017 These areas are not available for mineral materials for commercial, personal, or free use purposes. Administrative use of mineral materials is allowed.

1B-018 Requests for access to a non-Federal interest in lands pursuant to a reserved or outstanding right are recognized, and reasonable access is granted.

Scenery

1B-019 Management activities such as trail construction, maintenance, and signing are designed to meet or exceed a High Scenic Integrity Objective in all scenic classes.

Roads

1B-020 Do not permit road construction and reconstruction, subject to valid existing rights or leases.

1B-021 Roads are a priority for decommissioning.

1B-022 Existing roads can be maintained at their current level.

Lands and Special Uses

1B-023 These areas are not available for new special uses, except for research and outfitter-guide operations allowed under the Wilderness Act. Phase out existing long-term non-conforming uses.

1B-024 Allow commercial use by outfitters and guides if compatible with preservation of the wilderness values. Require outfitters and guides to use leave-no-trace techniques.

1B-025 These areas are unavailable for wind energy development.

2C2 - ELIGIBLE SCENIC RIVERS

About 55 miles are eligible for the National Wild and Scenic River System under the scenic river designation. Scenic rivers have corridor widths of one-quarter mile on each side of the river. For river segments that are eligible for designation, their outstandingly remarkable values and free flowing conditions that made them eligible are maintained (FEIS Appendix D). The eligible portions of these rivers and the one-quarter mile wide corridors on each side are managed to meet the requirements of the Wild and Scenic Rivers Act of 1968. The corridors of these eligible scenic rivers total about 2,000 acres on the Forest.

As described in the Act, a scenic river is a river or section of river that is "free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads."

Table 4-6. Eligible Scenic Rivers

Segment A of Back Creek
Cedar Creek
Segment B of Jackson River
Segment C of Jackson River
Segment B of North River
Segment B of Tye River

EMPHASIS

The primary emphasis of these rivers and their associated corridors is to protect and enhance the outstandingly remarkable scenic and geologic values as well as perpetuate the undeveloped setting and non-motorized access that led to the “scenic” classification. These river segments will be preserved in a free-flowing condition for the benefit, use, and enjoyment of present and future generations.

DESIRED CONDITIONS FOR 2C2 - ELIGIBLE SCENIC RIVERS

DC 2C2-01: Eligible river segments and their immediate environments are managed to preserve free-flowing conditions and to protect the outstanding values of the segments: scenic, recreation, geologic, fish and wildlife, historic, cultural, and similar values that made them eligible. Until designation decisions are made or other river studies are conducted, National Forest System lands associated with each eligible river corridors are managed to perpetuate or enhance each river’s current conditions. Characteristics of the rivers and their corridors are not reduced below the standards for classification as a Scenic River.

DC 2C2-02: The river and a one-quarter mile corridor on each side exist in a natural to near-natural setting and possess outstanding scenic quality. These areas retain a natural evolving landscape character shaped primarily by natural processes. The valued character of these landscapes is intact with no deviations. The characteristic landscape is that of continuous forest cover of predominantly hardwood species. Occasional small openings in the forest exist. The terrain is generally steep adjacent to the river, however some areas do possess a wide, flat river valley. Intermittent and perennial streams flow unobstructed from the side slopes into the river.

DC 2C2-03: The river and its channel are not modified except for fisheries habitat improvements. Dams or other structures that impede the flow of the river are prohibited. Some activities related to management of riparian dependent resources or wildlife habitat activities may be evident. The river user is aware that man’s past activities have changed the original character of the river and its surrounding landscape only in selected areas and for short stretches. Most users are not offended by these sights.

DC 2C2-04: Recreation use on the river and within the corridor is not concentrated, and visitors have the opportunity to experience some solitude and enjoy the primitive character of the surrounding landscape. Opportunities for wildlife viewing are good. In some areas the hydrologic processes over time have exposed geologic features. Water-based recreation activities such as swimming, wading, fishing, canoeing, rafting, and

kayaking occur in the rivers. The use of motor powered boats may be permitted in designated areas. Land-based recreation activities include hunting, hiking, horseback riding, and other activities that do not disturb the serenity of the area.

DC 2C2-05: Access to scenic river segments is provided at select locations. Emphasis on facilities is on health, safety, and resource protection plus some degree of user convenience. Roads, trails, and dispersed campsites are managed to discourage impacts to lakes, streams, and fragile soil resources.

DC 2C2-06: Lands within scenic river corridors are classified unsuitable for timber production.

DC 2C2-07: Recreation management is designed to provide solitude and remoteness in the most primitive and natural recreation setting possible. To this end, access to the area is limited to roads outside of the corridor, except reasonable access necessary to exercise development of private mineral rights. Trailheads at perimeter roads are designed with sensitivity to scale and character to perpetuate the scenic integrity of the area.

DC 2C2-08: Signs are designed to complement the natural environment in scale, character, and color. Most visitor information is provided outside of the scenic river corridor at trailheads and through off-site public information and education efforts. Scenic river visitors are encouraged to "pack-it-in and pack-it-out" and to "leave no trace."

DC 2C2-09: Wildland fires may be used to restore and maintain the historic fire regime. Integrated pest management favoring biological controls may be used to eradicate or suppress non-native invasive pests. Non-commercial felling of trees may be used to construct and maintain trails.

STANDARDS FOR 2C2 - ELIGIBLE SCENIC RIVERS

General

2C2-001 All management activities within this corridor must be compatible with the outstandingly remarkable values for the river.

Water, Soil, and Air

2C2-002 Maintain soils in a natural, undisturbed state, except for approved watershed restoration projects, wildland fire control measures, campsite rehabilitation, and trail construction, use, and maintenance. Favor natural healing of disturbed sites.

2C2-003 Instrumentation necessary for monitoring reference watershed conditions is allowed. Such instrumentation is designed to be unnoticeable to visitors.

Terrestrial and Aquatic Species

2C2-004 Existing old fields, wildlife openings, and other habitat improvements for fish and wildlife are maintained when they enhance the outstanding scenic values of the river corridor. New permanent wildlife openings are not created.

2C2-005 Allow stocking only to reestablish or maintain indigenous, threatened, endangered, or sensitive species with Forest Supervisor authorization.

Vegetation and Forest Health

2C2-006 Suppression and eradication actions to control gypsy moth infestations are allowed.

2C2-007 Actions to eradicate or suppress hemlock woolly adelgid infestations are allowed.

2C2-008 Eradicate non-native invasive plants when the infestations are isolated. Use hand-applied pesticides, with Forest Supervisor approval, when necessary.

2C2-009 Felling and leaving of individual trees is allowed for public safety and trail maintenance within appropriate trail clearing limits.

2C2-010 Allow vegetation management activities to:

- Maintain or enhance outstandingly remarkable values of the river corridor;
- Enhance or rehabilitate scenery;
- Provide for public health and safety.

Timber Management

2C2-011 These lands are classified as unsuitable for timber production. Timber harvest is not allowed unless associated with reasonable access to valid existing rights.

Non-timber Forest Products

2C2-012 Do not issue authorizations for the commercial or personal use of any forest products.

Wildland Fire Management

2C2-013 Vegetation management may be accomplished with wildfires and prescribed fire along with mechanical treatments as an appropriate method of reducing costs associated with these activities.

Scenery

2C2-014 Management activities are designed to meet or exceed a High Scenic Integrity Objective in all scenic classes.

Recreation

2C2-015 Eligible Scenic River corridors are managed with a range of recreation opportunities from roaded natural to semi-primitive motorized and semi-primitive non-motorized.

2C2-016 These corridors are unsuitable for designation of new All-Terrain Vehicle routes or use areas.

2C2-017 Restore existing trails, including steps and bridges, using native materials and Civilian Conservation Corps construction techniques.

2C2-018 Provide the minimum number of signs for the regulation or information of the user and the protection of the scenic values.

Minerals

2C2-019 These areas are suitable for federal oil and gas leasing with a “no surface occupancy” stipulation to protect the geologic resources and ecological values of the area. Other Federal minerals may be available on a case-by-case basis after full consideration of effects on geologic resources and ecological values.

2C2-020 These areas are not available for mineral materials for commercial, personal, or free use purposes. Administrative use of mineral materials is allowed to (a) administer the area; (b) protect geologic resources and ecological values; (c) restore riparian areas and aquatic habitat; (d) control erosion and sedimentation; or (e) repair flood damage.

Roads

2C2-021 Road construction is not allowed, subject to valid existing rights.

Lands and Special Uses

2C2-022 These areas are unsuitable for designation of new utility corridors, utility rights-of-way, communication sites or wind energy development. Existing uses may continue unless removal is necessary to protect the outstandingly remarkable values of the river.

2C3 - ELIGIBLE RECREATIONAL RIVERS

The following rivers are eligible for the National Wild and Scenic River System under the recreational river designation. There are approximately 200 miles that qualify as recreational rivers. Recreational rivers have corridor widths of one-quarter mile on each side of the river. For river segments that are eligible for designation, their outstandingly remarkable values and free flowing conditions that made them eligible are maintained (FEIS Appendix D). The eligible portions of these rivers and the one-quarter mile wide corridors on each side are managed to meet the requirements of the Wild and Scenic Rivers Act of 1968. The corridors of these eligible recreational rivers total about 4,000 acres on the Forest.

As described in the Act, recreational rivers are rivers or sections of river 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."

Table 4-7. Eligible Recreational Rivers

Segment B of Back Creek
Segments A & B of Cowpasture River
Segment C of Passage Creek
Segment D of Jackson River
North Fork of Shenandoah River
South Fork of Shenandoah River

EMPHASIS

These river segments and their associated corridors are eligible to be a part of the National Wild and Scenic Rivers System. They are managed to protect and perpetuate the outstandingly remarkable values that led to their eligibility status and classification as "recreational."

DESIRED CONDITIONS FOR 2C3 - ELIGIBLE RECREATIONAL RIVERS

DC 2C3-01: The primary emphasis for management of the river and river corridor is to protect and enhance the outstandingly remarkable values of that river or river segment. The recreational river corridor provides outstanding opportunities for people to enjoy a wide variety of river-oriented recreation opportunities in an attractive setting. The river is readily accessible by roads and may be accessed by railroads as well. Transportation facilities may parallel the river for long stretches.

DC 2C3-02: There is a low need for visitors to rely on their personal physical abilities and primitive recreation skills within these areas. The sights and sounds of other visitors are evident, and opportunities to encounter other visitors are moderate to high. Visitors seeking solitude may find that difficult to achieve, particularly in peak use seasons. Trails may be highly developed, including hardened trails for a high level of accessibility for persons of all abilities.

DC 2C3-03: The landscape character ranges from natural appearing to transitional-mixed use. There is substantial evidence of human activity along the shores of these rivers on adjoining private lands, sometimes including modern residential development, commercial structures, and a full range of various agricultural and forestry uses. On National Forest System lands, visitors enjoy a natural-appearing setting with a range of man-made recreational developments. Prescribed fire, felling and removal of trees, domestic livestock grazing, and integrated pest management activities may be observed. Utility transmission corridors, communication facilities, or signs of mineral development activity associated with reserved and outstanding mineral rights may be observed as well as controlled mineral activities under lease and use of mineral materials. The goal is to blend these uses into the background so that they remain visually subordinate to the natural landscape. Existing scenic integrity may range from High to Very Low, but the objectives on National Forest System lands are Moderate or higher.

DC 2C3-04: Since there is the potential for large numbers of visitors at peak use seasons, regulations are necessary for protection of resources and visitors. Information is provided at bulletin boards or kiosks at the river, as well as at off-site Forest Service visitor centers and in brochures. Visitors are encouraged to practice minimum impact techniques while recreating. Trash receptacles may be provided at parking areas and high use areas. Facilities of a modern nature are present to provide for visitor safety and comfort and to protect the river resources. Facilities are designed to fit the character of the specific sites where they are located. This could range from semi-primitive to rural. Facilities might include parking areas, trailheads, bulletin boards, interpretive kiosks, signs, restrooms, canoe/raft launches, fishing platforms, picnic sites, etc.

DC 2C3-05: These areas are characterized by a predominance of mid- and late-successional forests with a high to intermediate tolerance to shade. Forest structure varies according to ecological factors, but largely consists of a mature overstory of hardwoods, occasionally mixed with pines, a fairly open midstory, and a well-developed herbaceous and shrubby understory. Structural diversity within mixed mesophytic and dry-to-mesic oak forest communities may be enhanced through commercial and non-commercial vegetation management activities. Understory vegetation includes a variety of native deciduous and evergreen flowering trees, shrubs and wildflowers. Even- and uneven-aged forest communities are managed throughout the area, along with continued development of medium and small patches of late successional to old growth forest communities. Wildlife viewing opportunities are maintained and expanded and up to four percent of forested land may be in early successional forest conditions created both naturally and purposefully when compatible with the outstandingly remarkable values of the river corridor. Management activities and controls ensure rare communities and associated species continue to exist in the area.

STANDARDS FOR 2C3 - ELIGIBLE RECREATIONAL RIVERS

General

2C3-001 All management activities within this corridor must be compatible with the outstandingly remarkable values for the river.

Terrestrial and Aquatic Species

2C3-002 Allow creation of up to four percent early successional forest habitat.

2C3-003 Existing old fields, pastoral areas, wildlife openings, and other wildlife habitat improvements may be present and maintained. Expansion of existing openings and/or creation of new openings may occur. Non-invasive non-native plant species are sometimes used when establishing food plants for wildlife, but native species are preferred. Some openings provide permanent shrub/sapling habitats as a result of longer maintenance cycles.

Vegetation and Forest Health

2C3-004 Allow salvage of dead, dying, or damaged trees to maintain or enhance outstandingly remarkable values.

2C3-005 Allow vegetation management activities to:

- Maintain or enhance outstandingly remarkable values of the river corridor;
- Enhance or rehabilitate scenery;
- Maintain developed recreation facilities, including roads and trails;
- Enhance both game and non-game wildlife habitat;
- Improve threatened, endangered, sensitive, and locally rare species habitat;
- Maintain rare communities and species dependent on disturbance;
- Maintain, enhance, or restore the diversity and complexity of native vegetation;
- Suppress or control insect and disease outbreaks;
- Control non-native invasive vegetation;
- Reduce fuel buildups; or
- Provide for public health and safety.

2C3-006 Aggressively control insect and disease outbreaks when threatening the outstandingly remarkable values of the river corridor or when needed for safety or legal reasons. Consider eradication of recently established non-native pests. Favor the most effective control method.

Timber Management

2C3-007 These lands are classified as unsuitable for timber production. Vegetation management may be accomplished with commercial timber sales as an appropriate method of reducing costs associated with these activities.

Wildland Fire Management

2C3-008 Wildfires are generally managed to minimize acreage burned due to high levels of public use and infrastructure investments in these corridors.

2C3-009 Vegetation management may be accomplished with wildfires and prescribed fire along with mechanical treatments as an appropriate method of reducing costs associated with these activities.

Recreation

2C3-010 These corridors are unsuitable for designation of new All-Terrain Vehicle routes or use areas.

Scenery

2C3-011 Management activities are designed to meet or exceed the following Scenic Integrity Objectives:

Inventoried Scenic Class	1	2	3	4	5	6	7
Scenic Integrity Objectives	H	H	M	M	M	M	M

H=High; M=Moderate

Minerals

2C3-012 These corridors are suitable for federal oil and gas leasing with a “no surface occupancy” stipulation to protect the outstandingly remarkable resources of the river. Other Federal minerals may be available on a case-by-case basis.

2C3-013 Permit mineral materials for commercial, personal, free, and administrative use purposes with conditions to protect the outstandingly remarkable resources of the river corridor.

2C3-014 Some of these areas are underlain by private mineral rights. Requests for access to a non-Federal interest in lands pursuant to a reserved or outstanding right are recognized, and reasonable access is granted. Encourage such interests to protect outstandingly remarkable values when possible.

Roads

2C3-015 Allow road construction or reconstruction to improve recreational access, improve soil and water, to salvage timber, or to protect property or public safety.

2C3-016 Decommission roads that are causing environmental damage, degrading outstandingly remarkable values, or needed to manage visitor use and access.

Lands and Special Uses

2C3-017 These areas may be suitable for new utility structures, such as new transmission, gas, or water lines, only in the location with the least impacts to scenic integrity.

2C3-018 Screen overhead utility lines and support towers.

2C3-019 Allow other special uses when consistent and compatible with protection of the outstandingly remarkable values of the river corridor.

2C3-020 These areas are unavailable for wind energy development.

4A - APPALACHIAN NATIONAL SCENIC TRAIL CORRIDOR

Additional management direction for management of the Appalachian Trail corridor can be found in: National Trails System Act (Public Law 90-543, as amended); Appalachian Trail Comprehensive Plan; Landscape Aesthetics (Agriculture Handbook 701); Forest Service Directives (FSM, FSH, and supplements); Appalachian Trail Design, Construction, and Maintenance (ATC Stewardship Manual, second edition, 2000); Appalachian Trail Overnight-Use Management Principles; Checklist for the Location, Construction, and Maintenance of Campsites and Shelters on the Appalachian Trail (ATC Stewardship Series, revised 1989); Local Management Plans for the Appalachian Trail; Wilderness Act of 1964; Eastern Wilderness Act of 1975; Virginia Wilderness Acts; Numerous Memoranda of Agreement and Memoranda of Understanding between the USDA Forest Service and the National Park Service.

This prescription area consists of those lands mapped as the foreground area visible from the Appalachian National Scenic Trail footpath, and as designated on a case-by-case basis associated trail shelters, overnight use sites, viewpoints, water sources and spur trails. This prescription area also includes all National Forest System lands acquired by the National Park Service for the Appalachian Trail and administratively transferred to the USDA Forest Service by the National Park Service under a Memorandum of Agreement. The Appalachian National Scenic Trail Corridor on the GWNF is a total of about 9,000 acres.

The Appalachian National Scenic Trail is administered by the Secretary of the Interior in consultation with the Secretary of Agriculture, and is managed as a partnership between the Forest Service, the National Park Service Appalachian Trail Park Office, the Appalachian Trail Conservancy, and Appalachian Trail Conservancy-affiliated local Appalachian Trail clubs. Management is in accordance with the National Trails System Act and the Appalachian Trail Comprehensive Plan utilizing the cooperative management system.

EMPHASIS

Management practices are designed to protect the Appalachian Trail experience, preserve and strengthen the role of volunteers and volunteer organizations, provide opportunities for high quality outdoor recreation experiences, and provide for the conservation and enjoyment of the nationally significant scenic, historic, natural and cultural qualities of the land through which the Trail passes. Lands adjoining the prescription area seen from the Appalachian Trail will be managed for multiple uses under the provisions of this plan, in a manner which will reasonably harmonize with and be complementary to the Appalachian Trail experience.

DESIRED CONDITIONS FOR 4A - APPALACHIAN NATIONAL SCENIC TRAIL CORRIDOR

DC 4A-01: The Appalachian Trail is a way, continuous from Katahdin in Maine to Springer Mountain, Georgia that traverses the George Washington National Forest for travel on foot through the wild, scenic, wooded, pastoral, and culturally significant lands of the Appalachian Mountains. The Appalachian Trail 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 Appalachian Trail community.

DC 4A-02: Views from the Appalachian Trail are predominantly forested, sporadically intermixed with meadows, old fields, pastoral valleys, and cultural landscapes. Occasionally, the Appalachian Trail traverses high elevation balds and openings, which afford hikers unique and outstanding views. The Appalachian Trail offers a diversity of topography and a variety of vegetation and animal life, exposing the hiker to the entire range of land forms, water features, history, and uses of the land that are found along the Appalachian Mountains.

DC 4A-03: The prescription area consists of those lands mapped as foreground from the Appalachian Trail footpath and designated viewpoints, shelters, campsites, water sources, and spur trails linking these features, utilizing the Scenery Management System. The prescription area has a minimum width of 100 feet on either side of the Appalachian Trail footpath for protection from social, aural, and other impacts, but this minimum width should be considered only when the foreground zone does not extend beyond 100 feet on either side of the Appalachian Trail footpath.

DC 4A-04: Facilities include the Appalachian Trail footpath itself, shelters approximately one day's hike apart, designated overnight-use sites, privies, trailhead parking areas, and information boards at road crossings. The footpath itself wears lightly on the land, and is designed, constructed, and maintained for foot travel only. Associated structures are in harmony with the surrounding environment.

DC 4A-05: This prescription area traverses a range of Recreation Opportunity Spectrum classes. Management of the Appalachian Trail setting will either be consistent with or complement the semi-primitive non-motorized Recreation Opportunity Spectrum class. The linear nature of this prescription area is recognized in determining the Recreation Opportunity Spectrum class.

DC 4A-06: Recreation management is designed to provide a variety of opportunities in the most primitive and natural recreation setting possible. Careful acquisition and trail design has allowed an appearance of a more primitive setting than the Recreation Opportunity Spectrum would predict. Trailheads are designed with sensitivity to scale and character to set the tone for a non-motorized experience. Motorized recreation, bicycles, horses, and pack stock are not allowed on the Appalachian Trail footpath; although there are some rare exceptions (see Standards). Roads within one-half mile of the Appalachian Trail are managed with hiker security, safety, and Appalachian Trail values in mind.

DC 4A-07: Roads, utility transmission corridors, communication facilities, or signs of mineral development activity exist or may be seen within the prescription area, 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.

DC 4A-08: This prescription area retains a natural, forested or pastoral landscape character shaped by both natural processes and humans. Management practices are modified to recognize 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 Appalachian National Scenic Trail prescription area. Management activities needed to preserve or create vistas and desirable open areas are a high priority. Activities are planned and carried out in cooperation with appropriate Appalachian Trail management partners.

DC 4A-09: This prescription area is characterized by a predominance of mid- and late-successional forests with multiple canopy layers, which provide a variety of habitat niches, and thermal and protective cover for wildlife. Small to medium patches of old growth forest communities continue to develop throughout this area. Existing levels of early successional habitat conditions are maintained including: meadows, old fields, and openings created by flooding, wind damage, wildland fire, insect/disease infestations, or vegetation management activities. Occasional large openings of early successional habitat may be maintained as old fields and pastoral landscapes, as well as created through natural disturbance.

STANDARDS FOR 4A - APPALACHIAN NATIONAL SCENIC TRAIL CORRIDOR

Terrestrial and Aquatic Species

4A-001 Maintain the existing early successional forest habitat within this prescription area when compatible with Appalachian Trail values. Take advantage of natural disturbance events and continued maintenance of existing openings to meet the needs for early successional habitats.

4A-002 To enhance the Appalachian Trail environment, wildlife and fish habitat improvements are allowed. Existing wildlife openings, pastoral areas, or old fields may be maintained. Expansion of existing openings and/or creation of new openings may occur when compatible with Appalachian Trail values. Maintenance methods may include cultivation, grazing, herbicides, mowing, and prescribed burning. Use of native species will be emphasized.

Vegetation and Forest Health

4A-003 Vegetation is managed only to enhance the Trail environment. Allow timber harvest, prescribed burning, wildfire, hand tools, power tools, mowing, herbicides, biological controls, and grazing to manage vegetation as appropriate. Vegetation management activities are limited to:

- Maintain open areas, old field habitats and vistas, and create new vistas, that enhance the scenic qualities of the Appalachian Trail;
- Control insects and diseases;
- Maintain or improve threatened, endangered, sensitive, and locally rare species habitat;
- Maintain rare communities, species dependent on disturbance, and wildlife viewing opportunities;
- Meet trail construction and maintenance needs, including shelters;
- Manage fuels;
- Restore, enhance, or mimic historic fire regimes;
- Control non-native invasive vegetation;
- Provide for public safety or resource protection.

Timber Management

4A-004 The lands in this prescription area are classified as unsuitable for timber production.

4A-005 Hauling or skidding along the Appalachian Trail footpath itself or using the Appalachian Trail for landings or temporary roads is prohibited. Hauling and skidding within the prescription area will be allowed only if the environmental analysis indicates that this is the only feasible and prudent alternative.

Wildland Fire Management

4A-006 Suppression strategies will strive to minimize impact on Appalachian Trail values and implement Minimum Impact Suppression Techniques (MIST) tactics whenever possible.

4A-007 Prohibit heavy equipment line construction on the Appalachian Trail footpath, unless necessary for emergency protection of property and safety.

4A-008 Implement restorative measures in areas damaged by fire suppression efforts after fire suppression efforts have ceased.

Recreation

4A-009 Motorized, horse, pack stock, and bicycle use on the Appalachian Trail are prohibited. Exceptions include where the Appalachian Trail crosses or is located on open Forest Service system roads; other federal, state, county or other public roads or as needed for management of the Appalachian Trail; or for administrative or emergency purposes.

4A-010 Other uses within the prescription area, including crossings of the Appalachian Trail, may be considered following coordination with appropriate Appalachian Trail partners. Locate authorized uses crossing the Appalachian Trail to minimize impacts to the Appalachian Trail environment, preferably where impacts already exist.

4A-011 Overnight camping will be allowed, unless prohibited by Forest Supervisor's order.

4A-012 Identify the Appalachian Trail through standard signs and blazes.

4A-013 Locate and maintain shelters, campsites, and privies where there is a demonstrated need for overnight use.

4A-014 Reconstruct or relocate existing portions of the Appalachian Trail as needed to enhance the recreation experience, protect threatened, endangered, sensitive, and locally rare species; protect the health of the ecosystem; or protect cultural resources. Such relocations provide a reasonable level of public safety.

4A-015 Limit additional development to facilities compatible with the Appalachian Trail.

4A-016 This area is unsuitable for designation of new All-Terrain Vehicle use areas.

Scenery

4A-017 All management activities will meet or exceed a Scenic Integrity Objective of High.

Minerals

4A-018 The prescription area is suitable for oil and gas leasing with a "no surface occupancy" stipulation. The area is not available for other Federal leasable minerals.

4A-019 These areas are not available for mineral materials.

Roads

4A-020 Authorize new roads within the Appalachian Trail prescription area only if entering the prescription area is the only feasible and prudent location.

Lands and Special Uses

4A-021 Issue non-recreational special-use authorizations only where compatible with Appalachian Trail management or where there is a demonstrated public need or benefit and where no other reasonable alternatives exist.

4A-022 Authorize recreational special uses only when they do not adversely affect Appalachian Trail values and resources as described by this management prescription. Limit recreation events such as foot races or horseback endurance events to designated crossings only. Only temporary authorizations of one year or less for use of the footpath are allowed due to the probability of changing trail conditions or management needs except for existing permits. Existing permits may be renewed when there is no proposed change in use, or changes in trail conditions or management needs. Permits will not be issued for overnight camping at Appalachian Trail shelters or within 300 feet of the footpath.

4A-023 Do not authorize vendor or peddler permits.

4A-024 Allow agricultural special-use authorizations to maintain open and pastoral spaces.

4A-025 Locate new public utilities and rights-of-way in areas of this management prescription area where major impacts already exist. Limit linear utilities and rights-of-way to a single crossing of the prescription area, per project.

4A-026 Require mitigation measures including screening, feathering, and other visual management techniques to mitigate visual and other impacts of new or upgraded utility rights-of-way. Mitigation measures apply to facilities as well as vegetation.

4A-027 This management prescription area is unsuitable for special-use authorizations for new communication sites and wind generation sites.

4A-028 Management actions will generally discourage activities that would degrade the Trail's natural and cultural resources or social values, such as use by groups or organizations involved in promotion, sponsorship, or participation in spectator events or competitive activities, or by groups which by their size or commercial interest generate use which is inconsistent with the concept of a simple footpath.

Additional Direction

4A-029 The following standards will apply to the portion of the Appalachian National Scenic Trail Corridor that passes through the Three Sisters Remote Backcountry Area as displayed in Appendix I.

Timber may be cut, sold, or removed if one of the following circumstances exists. The cutting, sale, or removal of timber in these areas is expected to be infrequent.

(1) 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 remote area characteristics;
  (i) To improve threatened, endangered, proposed, or sensitive species habitat; or
  (ii) To maintain or restore the characteristics of ecosystem composition and structure, such as to reduce the risk of uncharacteristic wildfire effects, within the range of variability that would be expected to occur under natural disturbance regimes of the current climatic period;

(2) The cutting, sale, or removal of timber is incidental to the implementation of a management activity not otherwise prohibited; or

(3) The cutting, sale, or removal of timber is needed and appropriate for personal or administrative use.

Roads may not be constructed or reconstructed unless:

(1) 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 or property;

(2) A road is needed to conduct a response action under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) or to conduct a natural resource restoration action under CERCLA, Section 311 of the Clean Water Act, or the Oil Pollution Act;

(3) A road is needed pursuant to reserved or outstanding rights, or as provided for by statute or treaty;

(4) 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 or private access, natural resource management, or public health and safety;

(5) 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;

(6) 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

(7) 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 and resource management plan direction, regulations, and laws. 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.

4B - LITTLE LAUREL RUN RESEARCH NATURAL AREA

Research Natural Areas (RNAs) are part of a national network of ecological resources designated for research, education and maintenance of biological diversity on National Forest System lands. These areas are designated by the Regional Forester, U.S. Forest Service. Research Natural Areas are principally for non-manipulative research, observation, and study.

The Little Laurel Run Research Natural Area (2,092 acres) was established in 1938 and is located on the North River Ranger District. The Ramseys Draft Research Natural Area (1,794 acres) was established in 1935 and is wholly within the Ramseys Draft Wilderness. Therefore, management within the Ramseys Draft RNA is superseded by management direction for wilderness areas.

EMPHASIS

Manage for scientific research in an undisturbed state as a baseline for comparison with other forest environments.

DESIRED CONDITIONS FOR 4B - LITTLE LAUREL RUN RNA

DC 4B-01: The RNA and its ecosystems continue to furnish ecological information of value to the Forest Service and society at large. The area continues to be representative of the ecosystems it was established to represent. The landscape character will be natural evolving. Human uses are not causing detectable ecological change.

DC 4B-02: Species which occur in vegetation types influenced by natural environmental and ecological processes predominate. Visitors to a Research Natural Area can expect to see examples of the natural plant communities native to that physiographic region.

DC 4B-03: Vegetation is influenced by natural processes. The lands are classified as unsuitable for timber production.

STANDARDS FOR 4B - LITTLE LAUREL RUN RNA

Vegetation and Forest Health

4B-001 Native forest insect and disease outbreaks are controlled only to protect threatened, endangered, and sensitive species or to prevent unacceptable damage to resources on adjacent land. Non-native invasive insects and diseases may be eradicated or suppressed. Favor biological control methods.

4B-002 Eradicate non-native invasive plants when the infestations are isolated. Use hand-applied pesticides, with Forest Supervisor approval, when necessary.

Timber Management

4B-003 These lands are classified as unsuitable for timber production. No timber harvest shall be allowed, except as may be necessary in the control of fire, insects, and diseases; or to provide for public safety and trail access.

Non-timber Forest Products

4B-004 Do not permit the collection of non-timber forest products, except for scientific purposes as permitted by the Forest Supervisor.

Wildland Fire Management

4B-005 Wildfires and prescribed fire are allowed to restore and maintain the prescription area emphasis.

Recreation

4B-006 These areas are unsuitable for designation of new All-Terrain Vehicle use areas.

Scenery

4B-007 Management activities are designed to meet a Very High Scenic Integrity Objective.

Minerals

4B-008 Little Laurel Run RNA is not suitable for federal oil and gas leasing. Because Ramseys Draft RNA occurs within an existing wilderness, it is not legally available for federal oil and gas leasing or other Federal minerals.

4B-009 These areas are not available for mineral materials for commercial, personal, or free use purposes.

Roads

4B-010 Roads that do not contribute to the objective of preserving the natural ecosystem and not needed for protection of the area are closed and allowed to naturally revegetate. Other measures, such as seeding or planting, may be used if conditions warrant.

4B-011 Road construction is not normally permitted inside the area.

Lands and Special Uses

4B-012 These areas are unsuitable for designation of new utility corridors, utility rights-of-way, or communication sites or wind energy development.

4B-013 Special uses consistent with the Chief's establishment report could occur.

4C1 - GEOLOGIC AREAS

Two areas of the Forest are identified as Geologic Areas for their unique geological resources: Devils Garden (75 acres) on the Lee Ranger District and Rainbow Rocks (100 acres) on the James River Ranger District. In addition, nineteen cave sites are identified. One of the cave sites is in wilderness, two sites are located in Special Biological Areas, two sites are within the Indiana bat protection areas, and the rest are in this management prescription area. The total acreage of this management prescription area is about 3,000 acres.

EMPHASIS

Geologic Areas are managed to highlight and protect unique geologic resources as well as to develop public understanding of, and appreciation for, the influence of geology on the ecology and human history. Management focus is on protection of these sensitive areas and on showcasing the unique and scenic geologic resources.

DESIRED CONDITIONS FOR 4C1 - GEOLOGIC AREAS

DC 4C1-01: Sensitive karst areas are protected from human-caused detrimental hydrologic and habitat change. Recreational access through these areas may be limited in order to protect geologic resources. Geologic Areas provide outstanding opportunities for people to learn about the natural history of the Forest. Safe, barrier-free public access by road and trail may be provided and is designed to protect sensitive geologic resources. Where public access is unrestricted, interpretive information is available to develop understanding of the importance of protecting the geologic and biological communities of the area.

DC 4C1-02: Natural processes will eventually result in small to medium patches of late successional to old growth forest matrix dominated by shade tolerant hardwoods and eastern white pines throughout most of this area. Rare communities and associated species will continue to exist in the area. Insects and diseases play a major role in shaping future species composition and successional stages across these areas; however, integrated pest management favoring biological controls may be used to eradicate or suppress non-native invasive pests. Non-native vegetation occurs only as transients and is not self-perpetuating. Cavity trees, cull trees, standing dead trees, and down logs are common throughout the area as a result of natural mortality.

STANDARDS FOR 4C1 - GEOLOGIC AREAS

Water, Soil, and Air

4C1-001 Protect sensitive karst areas from human-caused detrimental hydrologic and habitat change.

Terrestrial and Aquatic Species

4C1-002 Existing old fields, wildlife openings, and other habitat improvements for fish and wildlife may be present and maintained, but no expansion of openings or creation of new permanent openings of this type occurs. Native species are emphasized when establishing food plants for wildlife. Some openings provide permanent shrub/sapling habitat as a result of longer maintenance cycles.

Vegetation and Forest Health

4C1-003 Native forest insect and disease outbreaks are controlled only to prevent unacceptable damage to resources on adjacent land or to protect threatened, endangered, and sensitive species. Non-native invasive insects and diseases may be eradicated or suppressed. Favor biological control methods.

4C1-004 Eradicate non-native invasive vegetation when the infestations are isolated. Use hand-applied pesticides, with Forest Supervisor approval, when necessary.

4C1-005 Use of wildland fire, integrated pest management, and felling of trees are allowed to:

- provide for public health and safety;
- maintain developed recreation facilities, including roads and trails;
- maintain rare communities and species dependent on disturbance;
- reduce fuel buildups; or
- control non-native invasive vegetation.

Timber Management

4C1-006 These lands are classified as unsuitable for timber production. Timber harvest is not allowed unless associated with salvage or reasonable access to valid existing rights.

4C1-007 Salvage of dead and dying trees is only allowed when there is a threat to health and safety or ecological resources.

Wildland Fire Management

4C1-008 Conduct prescribed fire and wildfire management activities recognizing sensitive geologic conditions in karst areas, including ground water.

Non-timber Forest Products

4C1-009 Do not permit the collection of non-timber forest products, except for scientific purposes as permitted by the Forest Supervisor.

Recreation

4C1-010 Recreational access through these areas may be restricted in order to protect geologic resources.

4C1-011 These areas are unsuitable for designation of new All-Terrain Vehicle routes or use areas.

Scenery

4C1-012 Management activities are designed to meet or exceed a High Scenic Integrity Objective.

Minerals

4C1-013 These areas are suitable for federal oil and gas leasing with a “no surface occupancy” stipulation to protect the geologic resources and ecological values of the area. Other Federal minerals may be available on a case-by-case basis after full consideration of effects on geologic resources and ecological values.

4C1-014 These areas are not available for mineral materials for commercial, personal, or free use purposes. Administrative use of mineral materials is allowed to (a) administer the area; (b) protect geologic resources and ecological values; (c) restore riparian areas and aquatic habitat; (d) control erosion and sedimentation; or (e) repair flood damage.

4C1-015 Private mineral rights exist. Roads, wells, and other necessary infrastructure associated with these leases and rights are allowed. Requests for access to a non-Federal interest in lands pursuant to a reserved or outstanding right are recognized and reasonable access is granted. Encourage such interests to avoid rare communities and minimize surface disturbances.

Roads

4C1-016 Do not permit road construction, subject to valid existing rights and leases.

4C1-017 Road reconstruction and minor relocation are permitted after full consideration of effects on geologic resources and ecological values.

Lands and Special Uses

4C1-018 Locate new public utilities and rights-of-way to areas of this prescription area where major impacts already exist. Limit linear utilities and rights-of-way to a single crossing of the prescription area, per project.

4C1-019 Require mitigation measures including screening, feathering, and other visual management techniques to mitigate visual and other impacts of new or upgraded utility rights-of-way. Mitigation measures apply to facilities as well as vegetation.

4C1-020 These areas are unavailable for wind energy development.

4D - BOTANICAL-ZOOLOGICAL AREAS (SPECIAL BIOLOGICAL AREAS)

Biological Areas are managed to include lands that support key components and concentrations of the Forest's biological diversity. These lands serve as core areas for conservation of the most significant and rarer elements of biological diversity identified to date on the Forest. These areas or communities are assemblages of plants and animals that occupy a small portion of the landscape, but contribute significantly to biological diversity.

These areas typically include high quality ecological communities such as high elevation mountain tops, shale barrens, caves and karst features, wetlands, and diverse habitat for threatened and endangered species, sensitive and locally rare species. These lands contain individual threatened, endangered, or rare natural communities found within major forest communities.

There are a total of about 121,000 acres of land identified as Special Biological Areas. This includes about 58,000 acres of Cow Knob Salamander habitat (management prescription area 8E7). Of the remaining 63,000 acres shown in Table 4-8, about 10,000 acres are within Wilderness, Recommended Wilderness, National Scenic Areas, or Indiana bat Primary Protection Areas. Approximately 53,000 acres are displayed on the Forest Plan map in this Special Biological Area Management Prescription; however, the size of an individual area may range from one acre to about 18,000 acres.

EMPHASIS

These lands serve as a network of core areas for conservation of significant elements of biological diversity. The goal of allocation to and management of these areas is to perpetuate or increase existing individual plant or animal species and communities that are of national, regional, or state significance and identified as threatened, endangered, sensitive, or locally rare.

DESIRED CONDITIONS FOR 4D – SPECIAL BIOLOGICAL AREAS

DC 4D-01: Botanical-Zoological areas are managed for the following: (1) protection of threatened, endangered, sensitive, or locally rare species from human taking or human-caused detrimental habitat changes; (2) stable or increasing populations of threatened, endangered, sensitive, or locally rare species; and (3) functioning ecosystems.

DC 4D-02: The natural evolving or natural appearing landscape character of these areas exhibits a variety of forested and non-forested communities frequently associated with disturbance like fire. Late successional to old growth forest communities may exist in some of these areas and additional acres will develop in future years. Ideally, natural processes within these areas proceed unencumbered by such disturbances as fire suppression, adjacent human development, and influx of non-native species. Prescribed fire, wildlife habitat improvements, integrated pest management, and occasional low intensity timber harvest may be appropriate management tools to maintain the long-term goals of the desired conditions in these areas related to the improvement of threatened, endangered, sensitive, and locally rare species habitat. Specific management activities necessary to maintain, restore, or enhance threatened, endangered, sensitive, and locally rare species for each special biological area are described in the Virginia Department of Conservation and Recreation, Division of Natural Heritage, Reports of Special Biological Areas and other pertinent biological reference material.

DC 4D-03: These management activities will result in a forest successional stage appropriate for maintaining the threatened, endangered, sensitive, and locally rare species. All areas are protected from human-caused detrimental habitat change, the taking of threatened or endangered species, and the collection of living plants or animals unless such collections are used for achieving the stated management goals. Recreational access through these areas may be limited in order to protect natural cultural resources. Where public access is unrestricted, interpretive information is available to develop understanding of the importance of protecting the plant and animal communities of the area.

DC 4D-04: Access to these areas may be limited. New roads are managed as closed. New trail sections to link existing trails or for education and interpretation are considered on a case-by-case basis. Recreation

opportunities are limited to interpretation, bird watching, wildlife viewing, nature photography, and use of non-motorized trails.

DC 4D-05: Some of these special biological areas lie within the foreground of the Appalachian National Scenic Trail. Within the foreground of the Appalachian Trail, management practices are designed to achieve the desired condition of this management prescription as well as protect the Appalachian Trail experience, strengthen the role of volunteers and volunteer organizations, provide opportunities for high quality outdoor recreation experiences, and provide for the conservation and enjoyment of the nationally significant scenic, historic, natural and cultural qualities of the land through which the Appalachian Trail passes.

DC 4D-06: These sites can be nominated for placement on State registries of natural areas. These voluntary agreements recognize the protection and management of natural areas that support rare species and significant natural communities.

STANDARDS FOR 4D – SPECIAL BIOLOGICAL AREAS

General

4D-001 In cooperation with the States' Natural Heritage agencies, make appropriate adjustments to 4D Special Biological Areas through the Forest Plan amendment process as new information becomes available.

Terrestrial and Aquatic Species

4D-002 Wildlife habitat improvements may be created, maintained, or enlarged if compatible with the habitat needs of the threatened, endangered, sensitive, and locally rare species. Only native species are used when establishing food plants for wildlife. Some openings provide permanent shrub/sapling habitats as a result of longer maintenance cycles.

4D-003 Existing openings or old fields are only maintained or created if they are compatible with the rare community.

4D-004 Control measures such as exclosures or trapping may be used where animal populations are adversely affecting rare communities.

4D-005 Beaver ponds and associated wetlands are managed in association with threatened, endangered, sensitive, and locally rare species. These areas are protected as rare communities when they support significant populations of these species or otherwise on a case-by-case basis. Other beaver populations and dams may be managed to: prevent adverse effects to public safety; roads, trails, and other facilities; private land resources; and other rare communities. Where protection of beaver ponds and associated wetlands are in conflict with other resource needs, decisions consider the beavers' role in natural processes and are based on the relative rarity of the communities and associated species involved, with the rarest elements receiving priority.

Vegetation and Forest Health

4D-006 Native forest insect and disease outbreaks are controlled only to prevent unacceptable damage to resources on adjacent land or to protect threatened, endangered, sensitive, or locally rare species. Non-native, invasive insects and diseases may be eradicated or suppressed to prevent a loss of the special biological community. Favor biological control methods.

4D-007 Eradicate non-native invasive plants when the infestations are isolated. Use hand-applied pesticides, with Forest Supervisor approval, when necessary.

4D-008 Vegetation management is allowed when compatible with the habitat needs of the threatened, endangered, sensitive, and locally rare species. Allow vegetation management activities to:

- Improve threatened, endangered, sensitive, and locally rare species habitat;
- Restore, enhance, or mimic historic fire regimes;
- Maintain, enhance or restore the diversity and complexity of native vegetation;
- Reduce insect and disease hazard;
- Control non-native invasive vegetation; or
- Provide for public safety and trail maintenance.

4D-009 Control non-native invasive species (plants, animals, insects, and diseases) where they are causing negative effects to rare communities. Do not introduce non-native species in or near rare communities, unless it is a natural enemy of a non-native pest.

4D-010 Allow native insects and diseases to play their natural ecological role if it does not pose a threat to the resource(s) for which the area was created.

4D-011 Removal of dead and down logs or other woody debris is only allowed within 100 feet of the centerline of an open road. Where needed to ensure public or employee safety, snags may be felled, but will be retained within the community as downed wood.

4D-012 For Laurel Fork and occupied habitat for shale barren rock cress, northeastern bulrush, smooth coneflower, swamp pink and Virginia sneezeweed, vegetation management activities shall only be conducted after consultation with the USFWS, and:

- Under an Endangered Species Act Section 10 research permit to determine the effects of an activity on the listed species or to determine activities that would contribute to the recovery of the species, or
- To improve or maintain the listed species or other TEP species habitat after research has demonstrated the beneficial effects of the proposed management, or
- When project-level assessment results in a no effect or may affect, not likely to adversely affect determination, or
- To address public safety concerns.

Timber Management

4D-013 These lands are classified as unsuitable for timber production. Vegetation management may be accomplished with commercial timber sales as an appropriate method of reducing costs associated with these activities.

4D-014 Salvage of dead and dying trees is only allowed if compatible with the biological resource for which the area was established.

Non-timber Forest Products

4D-015 Do not permit the collection of non-timber forest products, except for scientific purposes as permitted by the Forest Supervisor.

Wildland Fire Management

4D-016 Vegetation management may be accomplished with wildfire and prescribed fire along with mechanical treatments as an appropriate method of reducing costs associated with these activities.

4D-017 Prohibit new control line construction in or near bogs and seasonal ponds to avoid disrupting hydrology. Use existing roads, firelines, or streams to contain the burn wherever possible. Where

necessary, construct new firelines by less intensive methods such as wetline and cutting back flashy fuels. Handline may be used when it is the only option available.

4D-018 Do not construct firelines with heavy mechanized equipment (e.g. bulldozers and tractors) in rare communities when preparing for prescribed fire or managing wildfire, unless necessary to benefit or enhance the rare community (e.g. table mountain pine community).

4D-019 When necessary to include mesic deciduous forests within burning blocks, direct firing will not be done within these communities unless necessary to secure control lines. In these cases, only low intensity fires are allowed.

4D-020 Firelines constructed with heavy equipment are avoided whenever possible during wildfire management.

Recreation

4D-021 Where recreational uses are negatively affecting threatened, endangered, sensitive, and locally rare species, modify recreation sites or trails to reduce or eliminate negative effects. New or improved recreational developments are designed to avoid adverse effects to threatened, endangered, sensitive, and locally rare species.

4D-022 These areas are unsuitable for designation of new Off-Highway Vehicle routes or All-Terrain Vehicle use areas, unless crossing the area is the only feasible alternative or results in less environmental impact.

4D-023 New trails may be constructed only to link existing trails or to provide interpretation of botanical-zoological resources and only when air, water, soil and biological resources are protected.

4D-024 Interpretive facilities and services including trails, signs, viewing areas and self-guided programs may be provided to enhance visitor appreciation and understanding of the plant and animal communities within these areas.

Appalachian National Scenic Trail

4D-025 Within the foreground of the Appalachian Trail, all activities will be planned and carried out in cooperation with the appropriate Appalachian Trail management partner(s). See Management Prescription 4A for additional management direction applicable to this corridor.

Scenery

4D-026 Management activities are designed to meet or exceed the following Scenic Integrity Objectives:

Inventoried Scenic Class	1	2	3	4	5	6	7
Scenic Integrity Objectives	H	H	M	M	M	M	M

H=High; M=Moderate

Minerals

4D-027 These areas are suitable for federal oil and gas leasing with a “no surface occupancy” stipulation to protect threatened, endangered, sensitive, and locally rare species. Other Federal minerals may be available on a case-by-case basis after full consideration of effects on threatened, endangered, sensitive, and locally rare species.

4D-028 Permit mineral materials for commercial, personal, free, and administrative use purposes with conditions to protect threatened, endangered, sensitive, and locally rare species habitat.

4D-029 Private mineral rights exist in some of these areas. Roads, wells, and other necessary infrastructure associated with these rights are allowed. Requests for access to a non-Federal interest in lands pursuant to a reserved or outstanding right are recognized, and reasonable access is granted. Encourage such interests to minimize disturbance to threatened, endangered, sensitive, and locally rare species habitat.

Roads

4D-030 Only permit road construction to access valid existing rights and mineral leases, if necessary to achieve the objectives of the specific SBA, or if entering the rare community to access an adjacent area results in less environmental impact. Road reconstruction and minor relocation are permitted after full consideration of effects on the rare community and associated species and if there are no adverse impacts on threatened or endangered species.

4D-031 New roads are engineered to minimize impacts to the rare community and are managed as closed to public motorized travel.

Lands and Special Uses

4D-032 These areas are unsuitable for designation of new utility corridors, utility rights-of-way, communication sites or wind energy development. Existing uses may continue unless removal is necessary to protect threatened, endangered, sensitive, and locally rare species.

4D-033 Allow commercial use by outfitters and guides if compatible with preservation of the rare community values. Contest events such as foot races or horseback endurance events are generally discouraged, but can be considered on a case-by-case basis. Require outfitters and guides to use leave-no-trace techniques. Do not allow permanent camps.

Additional Direction

4D-034 The following standards will apply to those Special Biological Areas located within the Beards Mountain, Big Schloss, Dolly Ann, Elliott Knob, Jerkemtight, Laurel Fork, Oliver Mountain, Rich Hole, and Southern Massanutten remote backcountry areas and in the portion of the Kelley Mountain area as displayed in Appendix I.

Timber may be cut, sold, or removed if one of the following circumstances exists. The cutting, sale, or removal of timber in these areas is expected to be infrequent.

(1) 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 remote area characteristics;
  (i) To improve threatened, endangered, proposed, or sensitive species habitat; or
  (ii) To maintain or restore the characteristics of ecosystem composition and structure, such as to reduce the risk of uncharacteristic wildfire effects, within the range of variability that would be expected to occur under natural disturbance regimes of the current climatic period;
(2) The cutting, sale, or removal of timber is incidental to the implementation of a management activity not otherwise prohibited; or
(3) The cutting, sale, or removal of timber is needed and appropriate for personal or administrative use.

Roads may not be constructed or reconstructed unless:

(1) 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 or property;
(2) A road is needed to conduct a response action under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) or to conduct a natural resource restoration action under CERCLA, Section 311 of the Clean Water Act, or the Oil Pollution Act;
(3) A road is needed pursuant to reserved or outstanding rights, or as provided for by statute or treaty;
(4) 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 or private access, natural resource management, or public health and safety;
(5) 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;
(6) 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
(7) 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 and resource management plan direction, regulations, and laws. 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.

Table 4-8. List of Special Biological Areas

DISTRICT	SITE NAME	ACRES	SITE TYPE
PEDLAR	Big Levels - Macrosite	17,793	Montane Depression Wetlands
	Cellar Mountain	280	Mountain/Piedmont Seepage Swamp
	Cold Spring Branch	565	Mountain/Piedmont Seepage Swamp
	Cole Mountain	135	Montane Mixed Oak/Oak-Hickory Forest
	Davidson Run Pond	13	Montane Depression Wetlands
	Dawn's Branch	843	Mountain/Piedmont Seepage Swamp
	Humpback Mountain	366	Mafic Glade
	Little Irish Creek	39	Eastern Hemlock-Hardwood Forest
	Mount Pleasant	95	Outcrop Barren
	Mountain View Church	229	Mountain/Piedmont Seepage Swamp
	Nicholson Run Seeps	149	Mountain/Piedmont Seepage Swamp
	Pines Chapel Ponds	373	Montane Depression Wetlands
	Punchbowl Mountain	16	Carex Polymorpha Habitat
	Rocky Mountain Glade	42	Outcrop Barren
	Spy Rock	22	Outcrop Barren
	The Priest	723	Cliff Talus
	Three Ridges Mountain - Flatrock	8	Outcrop Barren
	Three Ridges Mountain - Hanging Rock	12	Outcrop Barren
	Upper Crabtree Creek	209	Mountain/Piedmont Seepage Swamp
	Upper St. Marys River	2,208	Pine-Oak/Heath Woodland
JAMES RIVER	Anthony Knobs	31	Central Appalachian Shale Barren
	Bennetts Run	2,145	Appalachian Grizzled Skipper Habitat
	Blue Suck Barren	23	Central Appalachian Shale Barren
	Brattons Run Shale Barren	222	Central Appalachian Shale Barren
	Cast Steel Pond	540	Montane Depression Wetlands
	Cemetery Barren	52	Central Appalachian Shale Barren
	Craig Creek Shale Barren	102	Central Appalachian Shale Barren
	D.S. Lancaster Shale Barren	68	Central Appalachian Shale Barren
	Daisy Knob Barrens	126	Central Appalachian Shale Barren
	Dry Run	2,076	Carex Polymorpha Habitat
	East Sharon Shale Barren	435	Central Appalachian Shale Barren
	Frozen Knob Montane Wetland	51	Montane Depression Wetlands
	Gauging Station Shale Barren	225	Central Appalachian Shale Barren
	Harrington Roadside	24	Dry/Mesic Calcareous Forest
	Harrington Shale Woodland	7	Mountain/Piedmont Acidic Woodland
	Johns Run East Barren	20	Central Appalachian Shale Barren
	Johns Run West Barren	68	Central Appalachian Shale Barren
	Johnsons Creek	335	Central Appalachian Shale Barren
	Lake Moomaw Barrens	434	Central Appalachian Shale Barren
	Lower Potts Creek Barren	57	Central Appalachian Shale Barren
	McGraw Hollow	79	Central Appalachian Shale Barren
	Morris Hill	291	Montane Dry Calcareous Forest/Woodland
	Ogle Creek	46	Central Appalachian Shale Barren
	Potts Pond	75	Montane Depression Wetlands
	Rough Mountain	206	Central Appalachian Shale Barren
	Solomons Run Barren	46	Central Appalachian Shale Barren

DISTRICT	SITE NAME	ACRES	SITE TYPE
LEE	Big Schloss	476	Mountain/Piedmont Acidic Woodland
	Browns Hollow	1,148	Central Appalachian Shale Barren
	Buck Mountain	1,245	Gaylussacia Brachycera Habitat
	Burnshire Bridge Slopes	8	Central Appalachian Shale Barren
	Church Mountain	169	Montane Dry Calcareous Forest/Woodland
	Cove Mountain Ponds	99	Montane Depression Wetlands
	Cub Run Headwaters	286	Carex Polymorpha Habitat
	Edinburg Gap Shale Barren	351	Central Appalachian Shale Barren
	Horsetail	91	Mountain/Piedmont Seepage Swamp
	Indian Grave Ridge	17	Arabis patens, Eleocharis compressa, Solidago rupestris Habitat
	Moreland Gap Bog	45	Appalachian Bog
	Overall Riverside	27	Solidago rupestris Habitat
	Passage Creek	173	Piedmont/Mtn Small-Stream Alluvial Forest
	Peach Orchard Gap	25	Central Appalachian Shale Barren
	Peters Mill Run Bog	525	Calcareous Fen
	Pond Run Pond	85	Montane Depression Wetlands
	Powells Fort Camp Bog	147	Calcareous Fen
	Salus Spring	304	Montane Calcareous Seepage Swamp
	Scothorn Gap	35	Mountain/Piedmont Seepage Swamp
	Signal Knob Barren	226	Central Appalachian Shale Barren
	Teets Bog	32	Montane Depression Wetlands
	Tibbet Knob	22	Montane Mixed Oak/Oak-Hickory Forest
	Trout Pond	2	Cave/Karst
	Twin Blackwater Ponds	17	Montane Depression Wetlands
	Vances Cove	6	Mountain/Piedmont Seepage Swamp
	Waterfall Mountain Cliffs	53	Cliff Talus
	Waterfall Mountain Seeps	71	Mountain/Piedmont Seepage Swamp
NORTH RIVER	Big Cedar Shale Barren	43	Central Appalachian Shale Barren
	Blackies Hollow	143	Central Appalachian Shale Barren
	Brushy Knob	134	Central Appalachian Shale Barren
	Camp Kannata	48	Central Appalachian Shale Barren
	Camp Run Prairie	163	Juniper Woodland
	Clayton Mill Pond	28	Montane Depression Wetlands
	Clayton Mill Spring	37	Mountain/Piedmont Seepage Swamp
	Daddy Run Barrens	103	Central Appalachian Shale Barren
	Dunkle Knob	170	Central Appalachian Shale Barren
	Elliott Knob	3,377	Northern Red Oak Forest
	Head Waters Shale Barren	98	Central Appalachian Shale Barren
	Heavener Mountain Shale Barren	57	Central Appalachian Shale Barren
	Little Fork Shale Barren	80	Central Appalachian Shale Barren
	Maple Springs	102	Montane Depression Wetlands
	Puffenbarger Glade	141	Sandstone Glade
	Ratcliff Hill	31	Central Appalachian Shale Barren
	Reubens Draft Shale Barren	39	Central Appalachian Shale Barren
	Road Hollow Ridge	74	Montane Mixed Oak/Oak-Hickory Forest
	Road Run Shale Barren	145	Central Appalachian Shale Barren
	Scott Hollow Barren	24	Central Appalachian Shale Barren

DISTRICT	SITE NAME	ACRES	SITE TYPE
NORTH RIVER	Sister Knob	1,554	Central Appalachian Shale Barren
	Stuart Run	473	Calcareous Cliff
	Sugar Run Shale Barren	202	Central Appalachian Shale Barren
	Swamp Run Trib Shale Barren	14	Central Appalachian Shale Barren
	Thompson's Shale Barren	17	Central Appalachian Shale Barren
	Whetmiller Knob	71	Central Appalachian Shale Barren
WARM SPRINGS	Beards Mountain	150	Montane Mixed Oak/Oak-Hickory Forest
	Blowing Springs	838	Dry/Mesic Calcareous Forests, cliff, cave
	Browns Pond	117	Montane Depression Wetlands
	Campground Barren	18	Central Appalachian Shale Barren
	Chestnut Ridge Seep	81	Mountain/Piedmont Seepage Swamp
	Chimney Rocks	590	Calcareous Cliff
	Copeland Barrens	160	Central Appalachian Shale Barren
	Cowardin Run	85	Central Appalachian Shale Barren
	Forest Road 462 Barrens	74	Central Appalachian Shale Barren
	Hidden Valley	1,135	Dry calcareous forest, cave/karst
	Laurel Fork	6,694	Central Appalachian Red Spruce Forest
	Limekiln Hollow	48	Central Appalachian Shale Barren
	Mill Hill	56	Cliff Talus, Calcareous
	Mill Mountain Pond	31	Montane Depression Wetlands
	Millboro Tunnel Shale Barren	207	Central Appalachian Shale Barren
	Mountain Grove Primary	635	Cave/Karst
	Nimrod Hall Ridge	202	Montane Dry Calcareous Forest/Woodland
	Northeast Beards Mountain	854	Central Appalachian Shale Barren
	Paddy Knob	1,847	Montane Mixed Oak/Oak-Hickory Forest
	Rough Mountain	2,744	Central Appalachian Shale Barren
	South Fork Pads Creek Barren	125	Central Appalachian Shale Barren
	Starr Chapel Primary	1,162	Cave/Karst
	Warm Springs Mountain	146	Eastern Hemlock-Hardwood Forest
	Winterberry Pond	59	Montane Depression Wetlands
Total	123 Areas	63,000	

4D1 - KEY NATURAL HERITAGE COMMUNITY AREAS

The two areas currently in this management prescription area are at Frozen Knob and Peters Mountain on the James River Ranger District (about 3,000 acres). These areas are dominated by dry to mesic oak dominated forest communities on geologic formations typical of the folded Appalachian ridges. The primary distinction of these two areas is the extent and older ages of much of the dominant vegetation that the Virginia Division of Natural Heritage considers to represent some of the best examples of this old growth forest type on this landform.

EMPHASIS

These lands provide high quality examples of vegetation communities that are not uncommon, but have distinctive characteristics needing management direction to maintain their character and are recommended by state or federal agencies.

DESIRED CONDITIONS FOR 4D1 - KEY NATURAL HERITAGE COMMUNITY AREAS

DC 4D1-01: Key Natural Heritage Community Areas are managed to maintain and enhance the unusual character of the vegetation for which the area was identified. For Frozen Knob and Peters Mountain this character is the old-age forest.

DC 4D1-02: The natural evolving or natural appearing landscape character of these areas exhibits predominantly a late successional to old growth forest community. Ideally, natural processes, including fire, within these areas proceed unencumbered and any management activity should mimic these natural processes.

DC 4D1-03: All areas are protected from human-caused detrimental habitat change and the collection of living plants or animals unless such collections are used for achieving the stated management goals. Recreational access through these areas may be limited in order to protect natural heritage resources. Where public access is unrestricted, interpretive information is available to develop understanding of the importance of protecting and managing the plant and animal communities of the area.

DC 4D1-04: Access to these areas may be limited. New roads are generally managed as closed, except when needed to reestablish public and administrative access to an area. New trail sections to link existing trails or for education and interpretation are considered on a case-by-case basis. Recreation opportunities emphasize: interpretation, bird watching, wildlife viewing, nature photography, and hiking on non-motorized, non-mechanized foot trails.

STANDARDS FOR 4D1 - KEY NATURAL HERITAGE COMMUNITY AREAS

The same standards as 4D–Botanical/Zoological Areas apply to this area. An exception to this is that construction of a road to reestablish public motorized access to Forest Road 173 such as that described in the 2013 Environmental Assessment for the Peters Mountain Access Project is allowed.

4E - CULTURAL AREAS

Cultural Areas consisting of seventeen prehistoric sites and fourteen historic sites have been identified. Some of these resources are listed as Priority Heritage Assets and others consist of cultural resources located within multi-use areas. Those areas containing resources accessible by the public for scientific study and education are the Confederate Breastworks, Camp Roosevelt, Elizabeth Furnace, Callie Furnace, Catherine Furnace, Capon Furnace, Van Buren Furnace, Mount Torry Furnace, Wallace House, High Knob Tower, Signal Knob, Brown Mountain Community, and Warwick Mansion. As of this time no prehistoric resources are available for public visit. Prehistoric and Historic sites are non-renewable resources found within National Forest System lands.

EMPHASIS

Cultural Areas are managed to highlight and protect unique historic resources as well as to develop public understanding of, and appreciation for, the influence of human history on the forest ecosystem. Sites are preserved and protected as appropriate in accordance with the law. Management focus is providing public access and education.

DESIRED CONDITIONS FOR 4E - CULTURAL AREAS

DC 4E-01: Significant cultural resources are protected from loss. Significant sites are stabilized, treated, managed and preserved for their historical research and/or cultural value. Effective relationships are maintained with Federal, State, Tribal and local governments and historic preservation organizations with interests in protecting cultural resources and promoting learning opportunities.

DC 4E-02: Cultural Areas provide outstanding opportunities for people to learn about the cultural history of the Forest and to enjoy a wide variety of recreation opportunities in an attractive setting. Safe, barrier-free public access by both roads and trails is provided and designed to protect sensitive historic resources. Sensitive resources and areas are protected from human-caused damage. Recreational access through parts of these areas may be limited in order to protect historic resources. Where public access is unrestricted, interpretive information is available to develop understanding of the importance of protecting the historic and biological communities of the area. Interpretive materials and services are high quality and effectively communicate the influence of people on the forest ecosystem. Historic Property Plans are prepared for these areas covering site interpretation; cultural/historic resource protection; vegetation, fire, and wildlife management; and other resource uses.

DC 4E-03: There is low need for visitors to rely on their personal physical abilities and primitive recreation skills. Education and interpretation are strongly emphasized and school groups are encouraged to visit the sites. The sights and sounds of other visitors are evident and opportunities to encounter other visitors are moderate to high. Visitors seeking solitude may find that difficult to achieve, particularly in peak use seasons. Trails may be highly developed, including hardened trails and boardwalks to protect the resource and to provide for a high level of accessibility for persons of all abilities. Mountain biking, horseback riding, and dispersed camping may be confined to designated trails and areas. Other appropriate recreational activities include hiking, bird watching, photography, hunting and fishing.

DC 4E-04: Visitors enjoy a variety of forested and non-forested communities, with outstanding and interesting historic features. The landscape character is typically historic, pastoral, or cultural often showing a great deal of human influence, surrounded by a natural appearing backdrop. Late successional to old growth forest communities occur in some of these areas and additional acres may be allowed to develop in future years if consistent with the historic character of the area.

DC 4E-05: Some of these cultural areas lie within the foreground of the Appalachian National Scenic Trail. Within the foreground of the Appalachian Trail, management practices are designed to achieve the desired condition of this management prescription as well as protect the Appalachian Trail experience, strengthen the role of volunteers and volunteer organizations, provide opportunities for high quality outdoor recreation experiences, and provide for the conservation and enjoyment of the nationally significant scenic, historic, natural and cultural qualities of the land through which the Appalachian Trail passes.

DC 4E-06: Since there is the potential for large numbers of visitors at peak use seasons, regulations are necessary for protection of resources and visitors. Information is provided at bulletin boards or kiosks, as well as at Forest Service visitor's centers and in brochures. Visitors are encouraged to practice minimum impact techniques while recreating. Trash receptacles may be provided at parking areas and high use areas. Modern facilities that fit with the historic character of the area are present to provide for visitor safety and comfort and to protect resources. Facilities are designed with sensitivity to character, scale, and color, which complement the surroundings at each specific site. This could range from semi-primitive to rural. Facilities might include parking areas, trailheads, bulletin boards, interpretive kiosks, signs, restrooms, canoe/raft launches, fishing platforms, picnic sites, etc.

DC 4E-07: These areas are characterized by a full range of forest successional stages from early to mid to late. Early successional forest conditions may be created when compatible with the cultural and historic objectives of the area. Vegetation is influenced both by natural processes and humans. Low intensity timber harvest, prescribed fire, wildlife habitat improvements, and integrated pest management are appropriate management tools to maintain the long-term goals of the desired condition related to education and interpretation of the historic uses of these areas. Wildland fires are suppressed using an appropriate management response to protect cultural resources.

STANDARDS FOR 4E - CULTURAL AREAS

General

4E-001 All management activities within these areas must be compatible with the protection and interpretation of cultural/historic resources.

Water, Soil, and Air

4E-002 Watershed restoration work is scheduled considering protection of historic values and resource elements.

Terrestrial and Aquatic Species

4E-003 Existing old fields, pastoral areas, wildlife openings, and other wildlife habitat improvements may be present and maintained. Expansion of existing openings and/or creation of new openings may occur. Non-invasive non-natives are sometimes used when establishing food plants for wildlife, but native species are preferred. Some openings provide permanent shrub/sapling habitats as a result of longer maintenance cycles.

Vegetation and Forest Health

4E-004 Control insect and disease outbreaks when necessary to protect the cultural/historic values, to reduce hazards to visitors, or for safety or legal reasons. Eradicate recently established non-native pests when possible. Favor the most effective control method.

4E-005 Non-native non-invasive species may be planted for watershed restoration purposes.

4E-006 Allow vegetation management activities to:

- Restore or maintain historic vegetative communities appropriate to the time period being emphasized;
- Demonstrate historic and present day logging systems;
- Enhance or rehabilitate scenery;
- Maintain recreation facilities, including roads and trails;
- Enhance both game and non-game wildlife habitat;
- Improve threatened, endangered, sensitive, and locally rare species habitat;
- Maintain rare communities and species dependent on disturbance;

- Reduce insect and disease hazard;
- Control non-native invasive vegetation;
- Reduce fuel buildups; or
- Provide for public health and safety.

Timber Management

4E-007 These areas are unsuitable for timber production. Vegetation management may be accomplished with commercial timber sales as an appropriate method of reducing costs associated with these activities.

4E-008 Salvage of dead and dying trees is only allowed if compatible with the cultural resources for which the area was established.

Wildland Fire Management

4E-009 A full range of suppression strategies are employed to protect cultural/historic resources that may be negatively impacted by fire.

4E-010 Vegetation management may be accomplished with wildfires and prescribed fire along with mechanical treatments as an appropriate method of reducing costs associated with these activities.

4E-011 Areas where heavy equipment fireline construction is prohibited are designated through the site plan for the area.

Recreation

4E-012 Recreational access through these areas may be restricted in order to protect historic and cultural resources.

4E-013 To the extent that cultural resources can be fully protected, interpretive facilities and services including trails, signs, viewing areas, self-guided programs, and buildings may be provided to enhance visitor appreciation and understanding of cultural resources.

Appalachian National Scenic Trail

4E-014 Within the foreground of the Appalachian Trail, all activities will be planned and carried out in cooperation with the appropriate Appalachian Trail management partner(s). See Management Area Prescription 4A for additional management direction applicable to this corridor.

Scenery

4E-015 Management activities are designed to meet or exceed the following Scenic Integrity Objectives:

Inventoried Scenic Class	1	2	3	4	5	6	7
Scenic Integrity Objectives	H	H	H	M	M	M	M

H=High; M=Moderate

4E-016 Facilities and management activities emphasize the historic landscape character.

Minerals

4E-017 These areas are suitable for federal oil and gas leasing with no surface occupancy to protect the cultural/historic resources and values. Other Federal minerals may be available on a case-by-case basis.

4E-018 These areas are not available for mineral materials for commercial, personal, or free use purposes. Administrative use of mineral materials is allowed.

Roads

4E-019 Only permit road construction to access valid existing rights and mineral leases, or if entering the area to access an adjacent area results in less environmental impact. Road reconstruction and minor relocation are permitted after full consideration of effects on the cultural resources.

Lands and Special Uses

4E-020 These areas are unsuitable for designation of new utility corridors, utility rights-of-way, communication sites and wind generation. Continue existing uses. Require a landscape management plan with screening, feathering, and other vegetation management techniques to mitigate the visual and other impacts of new, upgraded, or reauthorized utility corridors or communication sites.

4F - MOUNT PLEASANT NATIONAL SCENIC AREA

EMPHASIS

The 7,695-acre Mount Pleasant National Scenic Area was designated by the U.S. Congress in 1994. The purposes of the George Washington National Forest Mount Pleasant Scenic Area Act are to:

- Ensure appropriate protection and preservation of the area's scenic quality, water quality, natural characteristics, and water resources;
- Protect and manage vegetation to provide wildlife and fish habitat consistent with paragraph (1);
- Provide areas that may develop characteristics of old-growth forests; and
- Provide a variety of recreation opportunities that are consistent with the preceding purposes.

The Mount Pleasant National Scenic Area is well known for its prominent mountains, including Mount Pleasant, Pompey, and Cold Mountain, as well as the very popular Henry Lanum Memorial Trail, the Mount Pleasant Spur Trail, the Old Hotel Trail, and a portion of the Appalachian National Scenic Trail. Some of the best views on the Pedlar Ranger District are possible from Mount Pleasant and Cold Mountain.

The Congressional Act provides direction on what activities can occur and how they can occur within the Mount Pleasant National Scenic Area. The standards that follow mimic the Act. If differences in interpretation arise, the language in the Act governs *(16 U.S.C 545(b)(1))*.

DESIRED CONDITIONS FOR 4F - MOUNT PLEASANT NATIONAL SCENIC AREA

DC 4F-01: The Mount Pleasant National Scenic Area offers a variety of recreational opportunities for people to enjoy the outstanding scenery for which it received designation. These recreational offerings are in harmony with protecting unique biological and primitive recreation opportunities. This area is very popular for various forms of non-motorized dispersed recreation including hiking, hunting, horseback riding, and fishing.

DC 4F-02: The Mount Pleasant National Scenic Area offers excellent opportunities for solitude and serenity. The core of the Mount Pleasant National Scenic Area appears relatively remote.

DC 4F-03: The opportunity to encounter other visitors is high along roadways, at parking areas and trail overlooks, but may be moderate to low on trails away from congregated use areas. Visitors are rarely challenged to rely on their own physical abilities and outdoor skills. Once away from open roads and trailheads, opportunities for solitude are available. In these more remote areas, visitors may take on some risk and be challenged to rely on their own personal physical abilities. Most visitor information is dispensed outside of the National Scenic Area at trailheads and through off-site public information and education efforts.

DC 4F-04: Trails through this area are well-marked and may include features for visitors with special access needs, loop systems, and/or interpretation. Very few facilities are provided. Permanent human-made shelters may be present, particularly along the Appalachian National Scenic Trail. Construction of new shelters on new sites may be allowed if there is an obvious and overriding need to protect the natural resources from visitor impacts or for public health and safety.

DC 4F-05: The landscapes of these areas are primarily shaped by natural processes (floods, storms, insects, diseases, and fires) with occasional openings for wildlife viewing. Landscapes feature a structurally diverse mid- to late successional forest with pastoral and historic/cultural enclaves. Emphasis on natural processes results in patches of old growth forest. Cavity trees, standing dead trees, and down logs are common as a result of natural mortality. The valued character of the natural appearing and cultural landscapes either appears intact or is actually intact. Wildlife openings and old field habitats are maintained, however most of the area develops characteristics of older ecosystems.

STANDARDS FOR 4F - MOUNT PLEASANT NATIONAL SCENIC AREA

Terrestrial and Aquatic Species

4F-001 Existing old fields, wildlife openings, and other habitat improvements for fish and wildlife may be present and maintained, but no expansion of openings or creation of new permanent openings of this type occurs.

Vegetation and Forest Health

4F-002 Vegetation manipulation may be practiced for the maintenance of existing wildlife clearings and visual quality.

4F-003 Insect and disease outbreaks may be controlled to maintain scenic quality, prevent tree mortality, reduce hazards to visitors, or protect private lands.

Timber Management

4F-004 These lands are classified as unsuitable for timber production. No timber harvest shall be allowed, except as may be necessary in the control of fire, insects, and diseases; or to provide for public safety and trail access.

Non-timber Forest Products

4F-005 Harvesting of firewood for personal use is permitted along perimeter roads.

Wildland Fire Management

4F-006 Wildfire and prescribed fire may be used to manage the vegetation of existing wildlife clearings, provide wildlife habitat, or open areas in association with the Appalachian National Scenic Trail.

Recreation

4F-007 For management of lands along the Appalachian Trail, follow the standards listed under Management Prescription Area 4A of this Revised Forest Plan. Where conflicts occur between management of the Appalachian Trail and provisions of the Mount Pleasant Scenic Area Act, follow the provisions of the Act.

Scenery

4F-008 Management activities are designed to meet or exceed a High Scenic Integrity Objective.

Minerals

4F-009 All lands with federal mineral rights in the Mount Pleasant National Scenic Area are withdrawn from location, entry, and patent under the mining laws of the United States, and from leasing claims under the mineral and geothermal leasing laws of the United States, including amendments to such laws.

Roads

4F-010 No new permanent roads shall be constructed, except that this prohibition shall not be construed to deny access to private lands or interests therein in the Scenic Area.

4F-011 Motorized travel in the Scenic Area shall be allowed on State Route 635 and Forest Development Road 51. Except as listed above, motorized travel shall not be permitted within or on the boundary of the Scenic Area except as necessary for administrative use in furtherance of the purposes of

the George Washington National Forest Mount Pleasant Scenic Area Act of August 26, 1994 (PL 103-314).

4F-012 Any abandoned or closed roads are revegetated for resource protection.

Lands and Special Uses

4F-013 This area is unsuitable for designation of wind energy development.

4FA - SHENANDOAH MOUNTAIN RECOMMENDED NATIONAL SCENIC AREA

The 67,000 acre Shenandoah Mountain area is recommended to Congress for designation as a National Scenic Area. This section addresses the desired direction for management of the area. Actual direction for management of a National Scenic Area would be prescribed in the legislation that designates the area.

EMPHASIS

The purposes of the Shenandoah Mountain Scenic Area are to:

- Ensure appropriate protection and preservation of the area's scenic quality, water quality, natural characteristics, and water resources;
- Protect and manage vegetation to provide wildlife and fish habitat consistent with the previously described purpose;
- Protect habitat for the Cow Knob salamander;
- Provide areas that may develop characteristics of old-growth forests; and
- Provide a variety of recreation opportunities that are consistent with the preceding purposes.

The Shenandoah Mountain National Scenic Area is well known for its scenic overlooks from the crest of Shenandoah Mountain, particularly Reddish Knob. Some of the best views on the North River Ranger District are possible from the crest of Shenandoah Mountain. Shenandoah Mountain has exceptional beauty and outstanding opportunities for solitude, encompassing five National Forest roadless areas and surrounding Ramseys Draft Wilderness and the Little River watershed that is recommended for wilderness study. The area provides clean drinking water; clean air; and erosion and flood control for Shenandoah Valley residents. It is a large, substantially unfragmented forest teeming with wildlife and home to neo-tropical songbirds, black bear, native trout, and a number of rare species including the Cow Knob salamander. There are abundant recreational opportunities, including camping, hiking, mountain biking, horseback riding, fishing, hunting, rock-climbing, and birding.

DESIRED CONDITIONS FOR 4FA - SHENANDOAH MOUNTAIN RECOMMENDED NATIONAL SCENIC AREA

DC 4FA-01: The Shenandoah Mountain National Scenic Area offers scenic views and a variety of recreational experiences that are in harmony with protecting unique biological and primitive recreation opportunities. This area is very popular for various forms of non-motorized dispersed recreation including hiking, biking, hunting, horseback riding, and fishing.

DC 4FA-02: The Shenandoah National Scenic Area offers excellent opportunities for solitude and serenity. The core of the Shenandoah Mountain National Scenic Area appears relatively remote.

DC 4FA-03: Most of the Shenandoah Mountain National Scenic Area develops characteristics of older ecosystems. As the vegetation within the Shenandoah Mountain National Scenic Area continues to age, there is natural mortality. The area also reflects the important role of fire in shaping the character of the vegetation.

DC 4FA-04: Wildlife habitat conditions are similar to those found in Remote Backcountry areas. Within this area, habitats are managed to maintain or enhance Cow Knob salamander populations and populations of other threatened, endangered, sensitive, and locally rare (TESLR) species, including the Shenandoah Mountain salamander.

DC 4FA-05: Management activities limit negative impacts to Cow Knob salamander populations from permanent and long-term fragmentation, isolation, and edge effects (such as drying from increased insolation, impacts from edge predators, invasion of non-native invasive plants, and increased competition from other salamander species). No new permanent roads are constructed. Restoration of canopy and cover along temporary and decommissioned roads occurs quickly. Canopy closure along road rights-of-way is common. New trails may be constructed if no adverse effect on Cow Knob salamander populations will occur. Trail and road reconstruction, minor relocation, and new parking facilities are permitted. All activities are conducted with full consideration of effects on Cow Knob salamander populations.

STANDARDS FOR 4FA - SHENANDOAH MOUNTAIN RECOMMENDED NATIONAL SCENIC AREA

Terrestrial and Aquatic Species

4FA-001 Existing old fields, wildlife openings, and other habitat improvements for fish and wildlife may be present and maintained.

4FA-002 New wildlife openings of approximately 2-5 acres in size can be created near existing roads with the locations being determined before enabling legislation is passed. Openings can only be created in areas where there would be no negative impacts on Cow Knob salamander habitat.

Vegetation and Forest Health

4FA-003 Vegetation manipulation may be practiced for the maintenance of existing wildlife clearings and scenic enhancements.

4FA-004 Insect and disease outbreaks may be controlled to maintain scenic quality, prevent tree mortality, reduce hazards to visitors, or protect private lands.

4FA-005 Native forest insect and disease outbreaks are controlled only to prevent unacceptable damage to resources on adjacent land or to protect threatened, endangered, sensitive, or locally rare species. Non-native invasive insects and diseases may be eradicated or suppressed to prevent a loss of the special biological community. Favor biological control methods.

4FA-006 Control or eradicate non-native invasive plants using hand-applied herbicides, with Forest Supervisor approval, when necessary.

4FA-007 Control non-native invasive animals, insects, and diseases where they are causing negative effects to rare communities. Do not introduce non-native species in or near rare communities, unless it is a natural enemy of a non-native pest.

Timber Management

4FA-008 These lands are classified as unsuitable for timber production. No timber harvest shall be allowed, except as may be necessary in the control of fire, insects, and diseases; or to provide for public safety, trail access, and construction and maintenance of overlooks and vistas.

Non-timber Forest Products

4FA-009 Harvesting of firewood for personal use is permitted along roads.

Wildland Fire Management

4FA-010 Wildfire and prescribed fire may be used to manage the vegetation and restore and maintain the ecological systems in the area.

4FA-011 New dozer and/or plow control lines for prescribed burns are prohibited in or near bogs and seasonal ponds to avoid disrupting hydrology. Use existing roads, firelines, or streams to contain burns where possible. Favor construction of new firelines by using less intensive methods such as wetline, handline, and cutting back flashy fuels.

4FA-012 In areas of Cow Knob Salamander habitat (areas above 3,000 feet elevation), heavy mechanized equipment (e.g. bulldozers and tractors) may be used only if compatible with the values for which the Shenandoah Mountain Crest (8E7) management prescription area was created. The amount of disturbance will be reduced through the use of smaller sized bulldozers and tractors.

4FA-013 In areas outside of Cow Knob salamander habitat, firelines may be constructed with heavy equipment but the amount of disturbance will be reduced through the use of smaller sized bulldozers and tractors.

Recreation

4FA-014 Construction of trailheads and non-motorized trails is allowed when there is demonstrated demand and a partnership with one or more user groups committed to performing long-term maintenance.

4FA-015 Modify recreation sites or trails to reduce or eliminate negative effects where recreational uses are negatively affecting threatened, endangered, sensitive, and locally rare species. New and improved recreational developments are designed to avoid adverse effects to threatened, endangered, sensitive, and locally rare species.

4FA-016 Where appropriate, interpretive services (trails, signs, viewing areas) are provided to enhance visitors' understanding and appreciation of the area's special values.

4FA-017 Trails and other recreation facilities are located to minimize impacts occurring to the natural values of the established area.

4FA-018 Vistas and associated turn-outs may be maintained or increased where compatible with biological values.

4FA-019 Recreation facilities at High Knob Tower, Hone Quarry, Confederate Breastworks, and North River may continue to be managed to meet developed recreation needs.

Scenery

4FA-020 Management activities are designed to meet or exceed a High Scenic Integrity Objective.

Minerals

4FA-021 All lands with federal mineral rights in the Shenandoah Mountain National Scenic Area are not suitable for oil and gas and other Federal leasable minerals.

Roads

4FA-022 No new permanent roads shall be constructed, except that this prohibition shall not be construed to deny access to private lands or interests therein in the Scenic Area.

4FA-023 Reconstruction, minor relocation and construction of parking facilities are permitted where compatible with biological values.

4FA-024 Motorized travel is allowed on the system of roads within the area. New trailhead parking areas may be constructed along system roads.

4FA-025 Any abandoned or closed roads are revegetated for resource protection.

Lands and Special Uses

4FA-026 This area is unsuitable for designation of wind energy development.

5A – ADMINISTRATIVE SITES

EMPHASIS

Administrative sites include work centers, lookout towers, and Forest Service owned houses and offices. Sites are managed to serve/support resource programs and are maintained to protect capital investment.

DESIRED CONDITIONS FOR 5A - ADMINISTRATIVE SITES

DC 5A-01: Provide administrative sites and facilities that effectively and safely serve the public and accommodate the workforce. Administrative sites are readily accessed by road, although some are accessed by trails. The facilities should have barrier-free access.

DC 5A-02: The landscape character could range from natural appearing to urban/cultural. These areas are classified as unsuited for timber production.

DC 5A-03: Forest Service offices and/or visitor centers provide educational and/or interpretive opportunities such as exhibits and displays, books, videos and brochures. Where feasible and appropriate, short hiking trails are provided in association with office visitor centers. Lookout towers provide opportunities for viewing scenery on a grand scale. Hunting and fishing are generally not allowed at administrative sites.

DC 5A-04: Some of these administrative sites lie within the foreground of the Appalachian National Scenic Trail. Within the foreground of the Appalachian Trail, management practices are designed to achieve the desired condition of this management prescription as well as protect the Appalachian Trail experience, strengthen the role of volunteers and volunteer organizations, provide opportunities for high quality outdoor recreation experiences, and provide for the conservation and enjoyment of the nationally significant scenic, historic, natural and cultural qualities of the land through which the Appalachian Trail passes.

STANDARDS FOR 5A - ADMINISTRATIVE SITES

Vegetation and Forest Health

5A-001 Aggressively control forest insects, diseases, and non-native invasive plants using the most effective control method. Salvage is allowed.

Appalachian National Scenic Trail

5A-002 Within the foreground of the Appalachian Trail, all activities will be planned and carried out in cooperation with the appropriate Appalachian Trail management partner(s). See Management Area Prescription 4A for additional management direction applicable to this corridor.

Scenery

5A-003 Management activities are designed to meet or exceed the following Scenic Integrity Objectives:

Inventoried Scenic Class	1	2	3	4	5	6	7
Scenic Integrity Objectives	H	M	M	M	M	M	M

H=High; M=Moderate

Minerals

5A-004 This area is not available for commercial or personal use of mineral materials. Administrative and free use of mineral materials is allowed.

5B - DESIGNATED COMMUNICATIONS SITES

EMPHASIS

These designated sites contain special uses which serve a public benefit by providing a reliable communication network essential to local, regional, and national economies and security. These sites include ridgetop towers and other related facilities. These designated sites are managed to minimize adverse impacts on other resources. These sites are located at Signal Knob (Lee RD), Great North Mountain (Lee RD), Big Mountain (Lee RD), Elliot Knob (North River RD), White Grass Knob (North River RD), Narrowback Mountain (North River RD), North Mountain (James River RD), Fore Mountain (James River RD), Harmons Branch (James River RD), Alleghany County (James River RD), Rocky Mountain (Pedlar RD), Bald Mountain (Warm Springs RD), Little Back Creek (Warm Springs RD) and Duncan Knob (Warm Springs RD).

DESIRED CONDITIONS FOR 5B - DESIGNATED COMMUNICATION SITES

DC 5B-01: Existing special use authorizations for communications continue within these designated sites. Each site is developed and utilized to its greatest potential in order to reduce the need to develop additional sites. Where possible, existing sites are expanded as needed rather than creating additional areas. Colocation of communication equipment on existing towers is encouraged. All users' equipment are compatible with forest surroundings and others users' equipment and frequencies. New equipment should be as inconspicuous to the surrounding terrain as possible. Special use authorizations are issued.

DC 5B-02: Vegetation consists predominantly of low grasses and wildflowers with some native deciduous and evergreen shrubs. For the most part the areas consist of gently rolling terrain, some with exposed surface rock, rock outcrops, and meandering streams.

DC 5B-03: The protection of rare communities and species associates is provided, along with protection measures for population occurrences for threatened, endangered, sensitive, and locally rare species. This will provide a high likelihood that species within these associations will continue to persist on National Forest System lands.

DC 5B-04: The landscape character is cultural/urban. Scenery management techniques are used to mitigate adverse impacts. Utilizing existing and proposed towers to accommodate as many users as possible (within technical constraints) reduces tower clutter. These sites are non-forested, benefiting wildlife species, which favor grass, shrubs, old fields, and forest edges. These areas are managed to retain low growing vegetation which conforms to the safe operating requirements of the communication use and which reduce surface water runoff and erosion. Recreation is not emphasized or encouraged at these sites, although some of these sites are located within the foreground of the Appalachian National Scenic Trail.

STANDARDS FOR 5B - DESIGNATED COMMUNICATION SITES

See also Forestwide Standards FW-243 to FW-249.

General

5B-001 Communications towers no longer in use or determined to be obsolete are removed by the holder of the special use authorization within 18 months of cessation of use.

Vegetation and Forest Health

5B-002 Aggressively control non-native, invasive plant species within these areas.

Appalachian National Scenic Trail

5B-003 Within the foreground of the Appalachian Trail, all activities will be planned and carried out in cooperation with the appropriate Appalachian Trail management partner(s). See Management Area Prescription 4A for additional management direction applicable to this corridor.

Scenery

5B-004 Management activities are designed to meet or exceed the following Scenic Integrity Objectives:

Inventoried Scenic Class	1	2	3	4	5	6	7
Scenic Integrity Objectives	M	M	L	L	L	L	L

H=High; M=Moderate; L=Low

5B-005 Colocation of equipment on existing communication towers or electric transmission towers is preferred over adding new facilities or new sites.

5C – DESIGNATED UTILITY CORRIDORS

EMPHASIS

These designated corridors contain special uses which serve a public benefit by providing a reliable supply of electricity, natural gas, or water essential to local, regional, and national economies. They include long linear features like high voltage electric transmission lines and buried pipelines for public drinking water or natural gas. These designated corridors serve uses that require at least a 50 feet wide right-of-way. Local distribution lines are not included in this prescription area, but rather are part of the prescription area in which they are physically located. Approximately 7,000 acres are allocated to this management prescription area across the Forest.

DESIRED CONDITIONS FOR 5C - DESIGNATED UTILITY CORRIDORS

DC 5C-01: Existing linear special use authorizations for transmission lines and pipelines for water and natural gas will continue within these designated corridors. Rights-of-way for uses within designated utility corridors are authorized by special use permit or easement. Where possible, existing corridors are expanded as needed rather than creating additional areas. Compatible multiple uses are encouraged, including co-location of communication uses on existing electric transmission towers.

DC 5C-02: Vegetation consists predominantly of low grasses, wildflowers with some native deciduous and evergreen shrubs, low-growing trees like dogwood and redbud, and young, sapling-sized trees.

DC 5C-03: The protection of rare communities and species associates is provided, along with the protection measures for population occurrences for threatened, endangered, sensitive, and locally rare species. This will provide a high likelihood that species within these associations will continue to persist on National Forest System lands.

DC 5C-04: Utility corridors are prime areas for viewing wildlife species that favor grass, shrubs, old fields, and forest edges. These areas are managed to retain low growing vegetation which conforms to the safe operating requirements of the utility and which reduces surface water runoff and erosion. Recreation use is generally hunting-related, although existing trail systems often cross these corridors. Some of these corridors are located within the foreground of the Appalachian National Scenic Trail. The landscape character could range from natural appearing to pastoral/cultural. Scenery management techniques are used to mitigate adverse impacts. These lands are predominately non-forest and therefore classified as unsuitable for timber production.

STANDARDS FOR 5C - DESIGNATED UTILITY CORRIDORS

Terrestrial and Aquatic Species

5C-001 Where utility corridors pass through Special Biological Areas or Special Geologic Areas, any use of herbicides will be evaluated with respect to the resources for which the special areas were established.

Vegetation and Forest Health

5C-002 Aggressively control non-native, invasive plant species within these corridors.

Appalachian National Scenic Trail

5C-003 Within the foreground of the Appalachian Trail, all activities will be planned and carried out in cooperation with the appropriate Appalachian Trail management partner(s). See Management Prescription Area 4A for additional management direction applicable to this corridor.

Scenery

5C-004 Management activities are designed to meet or exceed the following Scenic Integrity Objectives:

Inventoried Scenic Class	1	2	3	4	5	6	7
Scenic Integrity Objectives	M	M	L	L	L	L	L

H=High; M=Moderate; L=Low

7A1 - HIGHLANDS SCENIC BYWAY

The Highlands Scenic Byway is a 19.6-mile loop designated by the Chief of the Forest Service. It is located in Alleghany and Rockbridge Counties and includes segments of State Route 850, State Route 770 and National Forest System Road 447. This management prescription area encompasses approximately 5,000 acres. From the dense forested stream valleys of Brattons Run and Simpson Creek to the upland hardwood forest on the ridge of North Mountain, the Highlands Scenic Drive weaves through scenery which consists primarily of a continuous cover of forest. There are views to impressive geologic formations on the upper slopes as well as beautiful cascading streams in narrow valleys. There are numerous remnants of a once thriving mining community, including building foundations and a narrow gauge railroad grade.

There is a modest interpretive facility, trailhead and short loop trails along Simpson Creek. Other short interpretive trails are located along the Highlands Scenic Tour route. At least three overlooks with parking are located along the ridge of North Mountain.

EMPHASIS

The Highlands Scenic Byway showcases the natural scenery, forest vegetation, cultural, geologic resources, and techniques used by the Forest Service to design and implement management activities in a manner that meets scenery integrity objectives and protects cultural and natural resources.

DESIRED CONDITIONS FOR 7A1 - HIGHLANDS SCENIC BYWAY

DC 7A1-01: Vegetation is influenced both by natural processes and humans. Biological communities are maintained or improved to provide an attractive setting for visitors, while providing for the protection of rare communities and threatened, endangered, sensitive or locally rare species. Forest management activities maintain the natural characteristics that make the area scenic. Up to 10% of forested land may be in early successional forest conditions created both naturally and purposefully to create visually diverse vegetation stages and provide opportunities to interpret management activities. Low intensity commercial timber harvest is appropriate to maintain the long-term goals of a diverse and vigorous forest.

DC 7A1-02: This area is characterized by a predominance of mid- and late-successional forests with a high to intermediate tolerance to shade. Forest structure varies according to ecological factors, but largely consists of a mature overstory of hardwoods, occasionally mixed with pines, a fairly open midstory, and a well-developed herbaceous and shrubby understory. Even- and uneven-aged forest communities are managed throughout the area, along with continued development of small and medium patches of late-successional and old growth forest communities.

DC 7A1-03: Road corridor improvements and facilities are evident changes to the natural environment. These components of a scenic byway and other man-made alterations fit well with the character of the surrounding landscape. Facilities include but are not limited to parking areas or pull-outs, trails or trailheads, buildings, viewing areas, and signs. Routes are signed to advise drivers of oversized vehicles and which routes are appropriate and safe for their use.

DC 7A1-04: Interpretation of forest management activities has been a theme of the byway since its designation. Interpretive signs inform visitors of past and present management activities and their benefits, such as wildlife habitat improvements, stream structures, protection of cultural resources, mining and commercial timber harvesting.

DC 7A1-05: The Tour is routed along paved and improved roads designed for motorcycles, cars, mini-vans and pick-up trucks. Turn-around areas are provided for oversized vehicles. The road is safe and the ride comfortable.

DC 7A1-06: The potential for encounters with other Forest visitors is moderate to high, especially at byway facilities. There are no opportunities for people seeking solitude in remote locations. There is low risk and little need for visitors to rely on personal physical abilities or primitive outdoor recreation skills.

STANDARDS FOR 7A1 - HIGHLANDS SCENIC BYWAY

Terrestrial and Aquatic Species

7A1-001 Existing old fields, wildlife openings, and other habitat improvements for fish and wildlife may be present and maintained. Expansion of existing openings and/or creation of new openings may occur, when compatible with the scenic and interpretive objectives.

Vegetation and Forest Health

7A1-002 In the foreground of the Byway, vegetation within the road corridor is managed to enhance landscape scenery and to ensure public safety.

7A1-003 Control insect and disease outbreaks, when necessary, to protect the scenic values, to reduce hazards to visitors, or for safety or legal reasons. Eradicate recently established non-native pests when possible. Favor the most effective control method.

Timber Management

7A1-004 In the foreground of the Byway, timber harvesting and other management practices may be employed to achieve the objectives of the Highlands Scenic Tour, such as interpretation of resource management including demonstrating harvest techniques. These practices meet a Scenic Integrity Objective of High and are designed to blend with the landscape.

7A1-005 In the middleground of the Byway, a variety of silvicultural practices that demonstrate and interpret forest management practices are employed to meet the desired future condition of this management area. All timber harvest methods are allowed provided they meet a Moderate Scenic Integrity Objective. Ground-based timber harvesting is restricted to slopes less than 35 percent. Cable harvesting systems are not limited to slope.

7A1-006 Salvage is allowed for scenic rehabilitation, fuel reduction, and to capture the economic value of dead, dying and diseased trees.

Recreation

7A1-007 Interpretive facilities and services including trails, signs, viewing areas, self-guided programs, and buildings may be provided to enhance visitor appreciation and understanding of natural, scenic and cultural resources and responsible, sustainable management and protection of those resources.

7A1-008 New non-motorized trails are allowed. Designation of new trails occurs on a case-by-case basis primarily for the purpose of interpretation when there is a demonstrated demand and a partnership with a user group committed to long-term maintenance.

Scenery

7A1-009 Management activities are designed to meet or exceed the following Scenic Integrity Objectives:

Inventoried Scenic Class	1	2	3	4	5	6	7
Scenic Integrity Objectives	H	M	M	M	M	M	M

H=High; M=Moderate

Minerals

7A1-010 These areas are suitable for federal oil and gas leasing with controlled surface use to protect scenic values. Other Federal minerals, including mineral materials, may be available on a case-by-case basis after full consideration of effects on the scenic resources.

Roads

7A1-011 Other than the Tour route itself, only temporary or Traffic Service Level (TSL) D roads may be constructed, which are closed to public use.

Lands and Special Uses

7A1-012 These areas may be suitable for new utility structures, such as new transmission, gas, or water lines, only in the location with the least impacts to scenic integrity.

7A1-013 Issue non-recreational special-use authorizations only where there is a demonstrated public need or benefit and where no other reasonable alternatives exist.

7B - SCENIC CORRIDORS

High quality scenery is provided in sensitive recreational and travelway settings. Examples include areas adjacent to gateway communities, areas around lakes, rivers, and backdrop areas viewed from major travelways and State-designated byways. The area visible during leaf-off for up to one-half mile from either side of the road typically defines the corridor. It also includes the visible middleground of the west face of Massanutten Mountain (a narrow strip) as seen from the Shenandoah Valley along Interstate 81. There are approximately 34,000 acres allocated to this management prescription area across the Forest. The scenic qualities of the landscape in these areas are maintained and their desired condition is described as follows:

Table 4-9. Sensitive Recreational Roads and Travelways

Interstate 64	State Highway 311
Amtrak Railroad Line	State Highway 55
Interstate 81	State Highway 130
US Highway 60	State Highway 39
US Highway 250	State Highway 42
US Highway 33	State Highway 924
US Highway 211	State Highway 850
US Highway 220	State Highway 770
US Highway 501	State Highway 629 north of Douthat State Park
State Highway 259	State Highway 629 south of Douthat State Park
State Highway 605	Forest Service Road 447
State Highway 718	Forest Service Road 125
State Highway 606	Forest Service Road 274
State Highway 687	Monongahela NF Forest Service Road 106
State Highway 56	

EMPHASIS

The emphasis is on providing, through maintenance or restoration and design, high quality scenery in sensitive recreational and travelway settings. Examples include areas adjacent to gateway communities, areas around lakes, rivers, and backdrop areas viewed from State-designated byways and major travelways.

DESIRED CONDITIONS FOR 7B - SCENIC CORRIDORS

DC 7B-01: These areas are characterized by high quality scenery in a setting conducive to a variety of recreational experiences. Human modifications are subordinate to the characteristic landscape. Landscape restoration and rehabilitation to meet high quality scenic conditions are a high priority. Coordination with nearby communities will help provide complementary management of adjoining lands.

DC 7B-02: The area provides exceptional opportunities for motorized recreation, especially scenic driving. The views along the corridors are natural appearing and include a variety of landscape characters, ranging from natural appearing to pastoral and historic/cultural, providing colorful accents and interesting textures, which change with the season. Visitors enjoy viewing wildlife in the occasional openings and meadows scattered throughout the forest. Water, geographic features, and cultural landscapes such as hay fields, grazing livestock, and the occasional rustic cabin provide scenic diversions to the predominately forested landscape. 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. Other management activities are not evident to the average visitor.

DC 7B-03: The prescription area is easily accessed. Maintaining a good road surface and providing informational signs for protection of the natural and cultural resources as well as the safety and comfort of visitors minimize impacts of visitors within the prescription area.

DC 7B-04: Hiking, mountain biking, and horse trails are present throughout the prescription area. In addition to enjoying the scenery and using various trails, visitors may engage in photography, wildlife viewing, hunting, and fishing. Facilities are designed to harmonize with the desired landscape setting. Facilities might include roads, pullouts, overlooks, parking areas, trailheads, bulletin boards, interpretive kiosks, rail fences, signs, restrooms, and picnic sites. Trails through this area are well-marked and may include features for visitors with special access needs, loop systems, and/or interpretive programs.

DC 7B-05: The sights and sounds of other visitors and motorized vehicles may be present. The opportunity to encounter other visitors is high along roadways, at parking areas, pullouts, and overlooks, but may be moderate to low on trails away from congregated use areas. At points of highly developed recreational use, visitors take on low risk and are not challenged to rely on their own physical abilities and outdoor skills. Once away from the more developed areas, opportunities for solitude are available. In these more remote areas, visitors may take on some risk and be challenged to rely on their own personal physical abilities and primitive recreational skills such as bouldering, climbing, stream fording, and orienteering.

DC 7B-06: Vegetation is influenced both by natural processes and humans. Biological communities are maintained or improved to provide an attractive setting for visitors, while providing for the protection of rare communities and threatened, endangered, sensitive, and locally rare species. Forest management activities maintain the natural characteristics that make the area scenic. Up to 4% of forested land may be in early successional forest conditions created both naturally and purposefully to create visually diverse vegetation stages compatible with scenic values. Low intensity commercial timber harvest is appropriate to maintain the long-term goals of a diverse and vigorous forest with sensitivity to dispersed recreation and scenic values. Relatively longer rotation ages and a lower percentage of early successional forest in these areas reflect a low intensity approach to vegetation management and the higher priority of recreation and scenic values. Timber harvesting operations focus on what is retained in the stand, not on wood fiber production. Timber harvest practices are visually subordinate to the surrounding landscape. In the foreground of these areas, management activities are rarely evident to the casual observer.

DC 7B-07: These areas are characterized by a predominance of mid- and late-successional forests with a high to intermediate tolerance to shade. Forest structure varies according to ecological factors, but largely consists of a mature overstory of hardwoods, occasionally mixed with pines, a fairly open midstory, and a well-developed herbaceous and shrubby understory. Understory vegetation includes a variety of native deciduous and evergreen flowering trees, shrubs and wildflowers. Even- and uneven-aged forest communities are managed throughout the area, along with continued development of medium and small patches of late successional to old growth forest communities.

DC 7B-08: Wildlife species associated with mid- to late-successional deciduous forest habitats are expected to inhabit this area. Wildlife viewing opportunities are maintained and expanded through cultivation, mowing, and burning of openings and pastoral areas.

STANDARDS FOR 7B - SCENIC CORRIDORS

Terrestrial and Aquatic Species

7B-001 Wildlife and fisheries habitat improvements are allowed to enhance wildlife viewing, hunting, and fishing opportunities in accordance with scenic integrity objectives. Watchable wildlife species habitat improvements are encouraged.

7B-002 Existing old fields, pastoral areas, and wildlife openings may be present and maintained. Expansion of existing openings and/or creation of new openings may occur. Non-invasive non-natives are sometimes used when establishing food plants for wildlife, but native species are preferred. Some openings provide permanent shrub/sapling habitats as a result of longer maintenance cycles.

Vegetation and Forest Health

7B-003 Forest structure is managed to favor flowering trees and shrubs.

7B-004 Control insect and disease outbreaks, when necessary, to protect the scenic values, to reduce hazards to visitors, or for safety or legal reasons. Eradicate recently established non-native pests when possible. Favor the most effective control method.

7B-005 Allow vegetation management activities to:

- Enhance or rehabilitate scenery, including:
  - Create aesthetically desired stand structure and species composition including a pleasing mosaic of tree species of various densities and stem sizes, park-like effects, and enhancement of fall color species;
  - Feature flowering trees, character trees, and shrub species;
  - Maintain open areas, old field habitats, pastoral settings, and vistas that enhance the scenic qualities of the corridor;
- Maintain developed recreation facilities, including roads and trails;
- Enhance both game and non-game wildlife habitat;
- Improve threatened, endangered, sensitive, and locally rare species habitat;
- Maintain rare communities and species dependent on disturbance;
- Reduce fuel buildups;
- Minimize impacts from insect or disease outbreaks and rehabilitate damaged areas;
- Control non-native invasive vegetation; or
- Provide for public health and safety.

7B-006 Salvage of dead, dying and damaged trees using ground based or helicopter logging can occur in scenic corridors and viewsheds to provide for scenic rehabilitation and public safety.

Timber Management

7B-007 Timber production is a suitable use in these areas. Some portions of the areas are identified as unsuitable for timber production due to the timber suitability analyses in Appendix C. Timber harvest practices are modified to recognize and enhance the aesthetic and recreational values of these lands.

7B-008 Group selection, individual tree selection, thinning, and shelterwood harvests are predominately used.

7B-009 Clearcutting may only be used to open up vistas, create spatial diversity along travelways, decrease straight line effect of cleared utility corridors, create watchable wildlife openings, for insect and disease suppression, or for scenic rehabilitation.

Wildland Fire Management

7B-010 Vegetation management may be accomplished with wildfires and prescribed fire along with mechanical treatments as an appropriate method of reducing costs associated with these activities.

Recreation

7B-011 Interpretive services including trails, signs, viewing areas, self-guided programs, and buildings may be provided to enhance the understanding of, and appreciation for the natural environment, and cultural resources.

Scenery

7B-012 Management activities are designed to meet or exceed the following Scenic Integrity Objectives:

Inventoried Scenic Class	1	2	3	4	5	6	7
Scenic Integrity Objectives	H	H	M	M	M	M	M

H=High; M=Moderate

7B-013 Short-term scenic integrity objectives of rehabilitation and enhancement may be used until scenic integrity objectives are achieved.

Minerals

7B-014 These corridors and viewsheds are suitable for federal oil and gas leasing with controlled surface use to protect the scenic resources and values. Other Federal minerals may be available on a case-by-case basis after full consideration of effects on scenic resources and values.

7B-015 Permit mineral materials for commercial, personal, free, and administrative use purposes with conditions to protect the scenic resources and values.

7B-016 Permit new borrow pits, provided they meet the scenic integrity objective. Rehabilitate or reclaim existing borrow pits that are currently not meeting the scenic integrity objective, after coordinating between resources to determine if a current need for borrow exists by the Forest Service or partner State or County agency.

7B-017 Consider opportunities to provide interpretation of interesting geologic or fossil features along roadsides, including in borrow pits.

Roads

7B-018 Permit new access roads, provided they quickly enter and leave the seen area and do not parallel existing travelways.

7B-019 All roads, facilities, and signing are designed to blend in with surroundings.

Lands and Special Uses

7B-020 These areas are unsuitable for designation of new utility corridors, utility rights-of-way, or communication sites. Continue existing uses. Require necessary mitigation techniques, including screening, feathering, and other vegetation management techniques to mitigate the visual and other impacts of new or upgraded, utility corridors or communication sites.

7B-021 Allow agricultural special-use authorizations to maintain open and pastoral spaces.

7B-022 Authorize other special uses if consistent and compatible with the goals and objectives of this area.

7B-023 These areas are unavailable for wind energy development.

7C - ATV USE AREAS

There are approximately 10,000 acres allocated to this management prescription area on the Forest. Three areas provide 64 miles of trails systems, including loop riding opportunities, for All-Terrain Vehicle (ATV) use as follows.

Table 4-10. ATV Areas

Ranger District	ATV Area Name	Existing Route Mileage	Allowed Uses
North River	Rocky Run	10	ATVs, 4WD*, motorbikes, mountain bikes
Lee	Taskers Gap - Peters Mill Run	36	ATVs, 4WD, motorbikes, mountain bikes
Pedlar	South Pedlar	18	ATVs, motorbikes, mountain bikes

*4WD vehicles are allowed on only portions of the Rocky Run Trail.

These are the only areas where ATV use is authorized. Licensed OHV use may occur on any open forest road, so a variety of opportunities exist for high-clearance and 4-wheel drive (4WD) vehicles on open roads.

EMPHASIS

Provide for motorized recreation opportunities in designated areas. These use areas and corridors contain routes designated specifically for licensed full size off-highway vehicle, ATV, and/or motorcycle users. The George Washington and Jefferson National Forests' Motorized Vehicle Use Map (MVUM) indicates the types of vehicles allowed on each route and in each area and any seasonal restrictions that apply on those routes and in those areas. Designated ATV use areas are managed to mitigate soil, water, and wildlife impacts. Facilities such as trailheads are provided to enhance the quality of the recreational experience and provide access to designated routes.

DESIRED CONDITIONS FOR 7C - ATV USE AREAS

DC 7C-01: ATV use areas are managed to provide a variety of motorized recreation opportunities on identified routes in natural appearing settings. Routes are maintained, improved, or expanded to meet local demands within the capability of the environment. Trail difficulty levels vary to accommodate a variety of desires and abilities within the capabilities of the environment. Users are adequately advised of trail difficulty levels and hazards. Support facilities, including trailheads, parking lots, restrooms, water access, and information boards, are well designed to meet the needs of the visitor. Use areas, route information, and regulations are provided to make the visitors' experience more enjoyable. These routes and areas are managed and monitored to absorb moderate to high levels of use while protecting soil, water, and air resource conditions.

DC 7C-02: Maintenance is performed to protect the routes and minimize effects to soil and water resources. Routes may be, and typically are, closed seasonally and during or immediately following periods of significant rainfall to protect resources. Off-route and other unauthorized OHV use are not allowed. When such use occurs to a chronic degree, the routes are closed permanently or until the situation is corrected. New routes are considered for development only when there is a demonstrated need and public interest, one or more partners committed to maintenance, and the air, soil, water and other biological resources can be protected.

DC 7C-03: ATV use areas provide primarily motorized recreation opportunities. While motorized recreation is emphasized on designated routes, other trail routes within the area could be used for hiking, mountain biking, and horseback riding. Other recreation opportunities such as hunting, fishing, and berry picking occur within the prescription area adjacent to the designated route corridors. Physical impacts are confined to the immediate trail or road profile and do not spread beyond. Though physical impacts from ATV use are confined to the immediate road or trail environment, sounds of motorized vehicles may be audible in other sections of the prescription area.

DC 7C-04: The landscape character is natural appearing with variations created by the recreational facilities. Recreationists enjoy traveling routes through a variety of landscapes. Along many of the routes, the views are restricted to the immediate foreground by vegetation and natural landform, but occasional openings reveal middleground or distant background vistas. Constructed routes blend well with the natural environment. Small created openings in the forest canopy may be apparent and visitors may see evidence of resource management activities; however, treatments blend with the natural landscape and vegetation diversity is enhanced over time. Constructed facilities are visually subordinate to the land.

DC 7C-05: A mix of forest successional stages will characterize use areas. Up to 16% of forested land may be in early successional forest conditions; however, there are no early successional wildlife habitat objectives associated with this prescription. Lands within this prescription area are classified as suitable for timber production. Roads used or constructed to facilitate vegetation treatment are managed to provide non-conflicting access for both timber harvest and motorized recreation uses.

DC 7C-06: Wildlife species associated with early successional forest habitats and mixed landscapes are expected to inhabit these areas.

STANDARDS FOR 7C - ATV USE AREAS

Roads

7C-001 When unacceptable resource damage occurs, the Forest Service will meet and coordinate with volunteer groups and partner organizations to identify the cause and to develop and implement an action plan to prevent further occurrence and to repair the damage. Repair, reconstruction, and relocation of portions of routes are favored over closing the entire route. When chronic problems occur, the entire route may need to be closed.

7C-002 At a minimum, post at trailheads messages on responsible trail riding (such as Ride 4 Keeps and TreadLightly!), trail etiquette, allowable trail uses (ATV, motorcycle, OHV, etc.), trail map, and other information for visitor safety and resource protection.

Water, Soil, and Air

7C-003 The trail system within each ATV use area must have a monitoring plan.

Terrestrial and Aquatic Species

7C-004 Existing old fields, pastoral areas, wildlife openings, and other wildlife habitat improvements may be present and maintained. Expansion of existing openings and/or creation of new openings may occur. Non-invasive non-natives are sometimes used when establishing food plants for wildlife, but native species are preferred. Some openings provide permanent shrub/sapling habitats as a result of longer maintenance cycles.

7C-005 Favor the retention of large (>20" dbh) standing snags and den trees when implementing silvicultural treatments.

Vegetation and Forest Health

7C-006 The forest health strategy is to diminish the occurrence of pest problems by managing host-type conditions at low hazard. Use appropriate and practical suppression of pests, both non-native and native, with all available tools as the normal practice.

7C-007 Salvage, cut and leave, and pruning are rapid and complete to protect the health and safety of visitors.

Timber Management

7C-008 Timber production is a suitable use in these areas. Some portions of the areas are identified as unsuitable for timber production due to the timber suitability analyses in Appendix C.

7C-009 Use even and uneven-aged silvicultural systems. Thinning and group selection may be employed to increase the structural diversity of the prescription area.

7C-010 Regeneration units range from 5 to 40 acres in size.

7C-011 Regeneration harvest areas are primarily coppice with reserves with 15- 25 square feet of basal area per acre left to ensure adequate sunlight for oak regeneration and two-aged silvicultural systems which leave 20-40 square feet of basal area per acre. In order to provide vertical diversity and future mast production, leave trees with a mean diameter of the codominant trees in the stand.

7C-012 Clearcut harvest systems occur when necessary to achieve specific wildlife habitat objectives. Thinning and group selection silvicultural systems are also employed to provide the structural diversity required by some species within this habitat association.

Wildland Fire Management

7C-013 Wildfire and prescribed fire are allowed to: create openings that stimulate soft mast production and browse; encourage oak sprouting; maintain, restore, and enhance native forest communities; ensure the continued presence of fire-dependent ecosystems; improve threatened, endangered, sensitive, and locally rare species habitat; and reduce fuel buildups. It is also used in conjunction with site preparation to accomplish silvicultural treatments.

7C-014 Implement needed restorative measures to travelways and trails after wildfires and prescribed burning. Firelines are obliterated as soon as practicable so they do not become unplanned trails.

Recreation

Trail Design

7C-015 Design and locate the trail network to discourage illegal access to areas off the designated routes. Full advantage is taken of natural and man-made features to use as physical barriers to illegal use.

7C-016 Prioritize new route locations as follows: 1) Existing open or closed system roads, 2) Closed or obliterated roads, 3) New construction.

7C-017 Construct trail and road systems that include both single-track, narrow trails for the motorcycle and ATV user as well as roads that may be used for larger four-wheel drive vehicles and for timber removal. To the extent feasible, design loop trails of varying skill levels with bypasses or return routes that allow users the option to avoid sections rated beyond their skill and/or comfort level.

7C-018 Minimize user conflicts and safety hazards that may exist with other recreation users and between full size four-wheel drive vehicle users and ATV and motorcycle users, through trail design, layout, and signing.

7C-019 Minimize adverse effects on the land and resources, through trail design, layout, and management. Minimize damage to soil, watershed, vegetation, wildlife habitat, or other natural, cultural, and historical resources, and disturbance of wildlife on the public lands.

7C-020 Plan timber removal concurrently with possible route locations and opportunities.

7C-021 Obliterate decommissioned routes through restoration to their natural profile and revegetate to prevent continued use.

Trail Management

7C-022 Actively recruit volunteer organizations through the Adopt-A-Trail and other partner programs to become involved in the long-term construction and maintenance of trail systems.

7C-023 Relocate or close routes when unacceptable adverse effects occur or are likely to occur. The routes or trails remain closed until the adverse effects are eliminated and until measures are implemented to prevent recurrence.

7C-024 Relocate or close existing routes located in or adjacent to sensitive areas. Restore and revegetate unneeded old routes to their natural profile.

7C-025 Trail system designs with a series of loops are encouraged. This results in a more compact trail system that confines impacts and provides more options for users of varying skill levels.

Public Safety and Law Enforcement

7C-026 Promote public safety and effective law enforcement.

7C-027 Provide sanitary facilities in ATV areas where practical and needed for resource protection.

7C-028 Within ATV areas, provide public information that, as a minimum, includes maps showing open, closed, and restricted routes and areas, as well as the conditions of such use.

Monitoring

7C-029 The effects of vehicle use, noise levels, enforcement of restrictions and closures are closely monitored and evaluated.

Scenery

7C-030 Management activities are designed to meet or exceed the following Scenic Integrity Objectives:

Inventoried Scenic Class	1	2	3	4	5	6	7
Scenic Integrity Objectives	H	M	L	L	L	L	L

H=High; M=Moderate; L=Low

7D - CONCENTRATED RECREATION ZONES

Since its earliest days, the George Washington National Forest has offered facilities to the public for overnight and day use recreation activities. Under the New Deal of the 1930s and early 1940s, the Civilian Conservation Corps constructed multiple recreation sites across the National Forest. Several decades later, in 1962, the Outdoor Resources Review Commission's report to Congress and the President resulted in appropriated funds dedicated to providing more developed recreation facilities on public lands, including the George Washington NF. The 1987 President's Commission on Americans Outdoors report also recommended additional outdoor recreation opportunities and facilities be provided on public lands, although the funding for implementation was minimal compared to the earlier employment and recreation initiatives. There are approximately 700 acres allocated to this management prescription area.

Today, the George Washington National Forest offers the following developed recreation facilities:

- 21 campgrounds and complexes ranging from highly developed to primitive;
- 1 horse camp, primitive;
- 10 picnic sites;
- 7 swimming beaches;
- 2 boat launches on Lake Moomaw where gas powered motors are allowed;
- 9 boat launches on rivers, lakes and ponds that do not allow gas powered motors;
- 10 interpretive sites;
- 4 observation sites; and
- 4 shooting ranges.

In addition to these developed recreation sites, there are numerous developed trailhead parking areas that provide access to trails and multiple dispersed recreation opportunities.

EMPHASIS

Concentrated Recreation Zones are managed to provide the public with a variety of recreational opportunities in visually appealing and environmentally healthy settings. Developed recreation areas, concentrated use areas, and areas of high density dispersed recreation activity form Concentrated Recreation Zones. Facilities are provided to enhance the quality of the recreational experience and/or to mitigate damage to the affected ecosystems. These areas also serve as gateways to the wide diversity of recreation opportunities on the remainder of the forests.

DESIRED CONDITIONS FOR 7D - CONCENTRATED RECREATION ZONES

DC 7D-01: Visitors are able to choose from a wide variety of recreation opportunities in high quality, well maintained developed or dispersed settings. Campgrounds, picnic sites, boat ramps, river access sites, swimming beaches, interpretive sites, rifle ranges, trailheads and concentrated trail systems, are all examples of facilities found in Concentrated Recreation Zones. Other facilities consistent with the mission and complimentary to the ecosystem may also be provided. Constructed facilities are visually subordinate to the valued landscape scenery and are constructed and maintained to a development scale appropriate to the recreational opportunity spectrum class. Facilities that provide for protection of resources or user comfort (depending on the development scale of the recreation site), are provided within the developed recreation areas. Toilet facilities may be provided outside of the developed areas if needed for the protection of resources. Outdoor skills are generally of low importance except where knowledge of specialized activities, (i.e. boating or horseback riding) is critical. Trails through this area are well-marked and may include features for visitors with special access needs, loop systems, and/or interpretive programs. Motorized access and their support facilities (i.e. roads, parking lots, or water access) are emphasized, although non-motorized experiences (i.e. walking and viewing nature) are also often present.

DC 7D-02: Use may be highly concentrated in some spaces or relatively uncrowded in other sections of Concentrated Recreation Zones. Recreation information and regulations are provided to make the visitors' experience more enjoyable. Interpretive programs may also be offered to enhance the visitor's educational and

recreational experience. Access to fishing, hunting, and nature study are emphasized. Fish stocking is appropriate for Concentrated Recreation Zones.

DC 7D-03: The landscape character is a cultural enclave in natural appearing surroundings. A visually appealing landscape is emphasized by featuring special attractions like large rock outcroppings and waterfalls. Management activities maintain a healthy mid-successional forest of mixed hardwoods, hemlocks, and white pines. Understory vegetation includes a variety of native deciduous and evergreen flowering trees, shrubs and wildflowers. These areas may also include natural appearing open areas, balds, or pastoral landscapes. The scenic integrity objectives are in the upper values of high to moderate.

DC 7D-04: Some of these concentrated recreation areas are within the foreground of the Appalachian National Scenic Trail. Within the foreground of the Appalachian Trail, management practices are designed to achieve the desired condition of this management prescription as well as protect the Appalachian Trail experience, strengthen the role of volunteers and volunteer organizations, provide opportunities for high quality outdoor recreation experiences, and provide for the conservation and enjoyment of the nationally significant scenic, historic, natural and cultural qualities of the land through which the Appalachian Trail passes.

DC 7D-05: Vegetation is influenced to a large degree by humans, both through management for aesthetics and safety and through the high level of recreation use. Commercial timber harvest is appropriate to maintain the long-term goals of a diverse and vigorous forest emphasizing recreation, scenery, and visitor safety. Timber harvesting operations focus on what is retained in the forest, not on wood fiber production. Timber harvest is carefully timed and designed to be subtle. Integrated pest management is used to eradicate or suppress insects, diseases, and non-native, invasive vegetation.

DC 7D-06: Even and uneven-aged forest communities continue to develop throughout the area, along with medium and small patches of late successional to old growth forest communities. Up to four percent of forested land may be in early successional forest conditions created both naturally and purposefully when compatible with the recreation and scenic objectives of the concentrated recreation area; however, no early successional habitat objectives are associated with this prescription. Wildlife viewing opportunities are maintained and expanded through livestock grazing, cultivation, mowing, and burning of openings and pastoral areas.

STANDARDS FOR 7D - CONCENTRATED RECREATION ZONES

Terrestrial and Aquatic Species

7D-001 Wildlife and fish habitat improvements are allowed to enhance wildlife viewing and fishing opportunities in a manner complimentary to the area. Existing wildlife openings, pastoral areas, or old fields may be maintained. Expansion of existing openings and/or creation of new openings may occur. Maintenance methods may include cultivation, grazing, mowing, and burning. Use of native species will be emphasized.

7D-002 Improvements appear natural and remain subordinate to the landscape. Watchable wildlife species habitat improvements are encouraged.

7D-003 Hunting is prohibited within developed recreation sites.

Vegetation and Forest Health

7D-004 The forest health strategy is to prevent the occurrence of pest problems by managing host-type conditions at low hazard. Aggressive suppression of pests, both non-native and native, with all available integrated pest management tools is normal practice. Favor the most effective control method. Salvage, cut and leave, and pruning are rapid and complete to protect the health and safety of visitors and facilities.

7D-005 Allow vegetation management activities to:

- Maintain developed and dispersed recreation facilities, including roads and trails;
- Maintain open areas, old field habitats, pastoral settings, and vistas that enhance the scenic qualities of the recreation area;
- Enhance or rehabilitate scenery, including:
  - Create aesthetically desired stand structure and species composition including a pleasing mosaic of tree species of various densities and stem sizes, park like effects, and enhancement of fall color species;
  - Feature flowering trees, character trees, and shrub species;
- Enhance both game and non-game wildlife habitat;
- Minimize impacts from insect or disease outbreaks and rehabilitate damaged areas;
- Reduce fuel buildups;
- Control non-native invasive vegetation; or
- Provide for public health and safety.

7D-006 Prepare vegetation management plans that emphasize damage prevention practices for developed recreation areas.

Timber Management

7D-007 These lands are classified as unsuitable for timber production. Vegetation management may be accomplished with commercial timber sales as an appropriate method of reducing costs associated with these activities.

7D-008 Clearcutting may only be used to open up vistas, create spatial diversity along travelways, decrease straight line effect of cleared utility corridors, create watchable wildlife openings, for insect and disease suppression, or for scenic rehabilitation.

Wildland Fire Management

7D-009 Wildfires are generally suppressed to minimize acreage burned due to high levels of public use and infrastructure investments in these areas.

7D-010 Prescribed fire is permitted for vegetation management to meet scenery, landscape character and hazard fuels reduction objectives. In developed recreation areas, evidence of firelines is rehabilitated as soon as practicable.

7D-011 Implement needed restorative measures to trails and travelways after wildland fire management. Firelines are rehabilitated as soon as practicable.

Recreation

7D-012 Concentrated-use areas are inspected annually and high-risk conditions are corrected, identified to the public, or the area is closed.

7D-013 Where needed and practical, restrooms are provided.

7D-014 High-risk site conditions that develop during the use season are mitigated or the site is closed.

7D-015 These areas are unsuitable for designation of All-Terrain Vehicle use areas, although trailheads and connecting trails to adjacent ATV use areas are allowed.

Appalachian National Scenic Trail

7D-016 Within the foreground of the Appalachian Trail, all activities will be planned and carried out in cooperation with the appropriate Appalachian Trail management partner(s). See Management Prescription Area 4A for additional management direction applicable to this corridor.

Scenery

7D-017 The landscape character is natural appearing, pastoral, or historic with variations created by the recreational facilities.

7D-018 Management activities in concentrated recreation zones, except rifle ranges, are designed to meet or exceed the following Scenic Integrity Objectives:

Inventoried Scenic Class	1	2	3	4	5	6	7
Scenic Integrity Objectives	H	H	M	M	M	M	M

H=High; M=Moderate

7D-019 Rifle ranges are managed to meet or exceed a Low scenic integrity objective across all scenic classes.

Roads

7D-020 All roads, facilities, and signing are designed to blend in with surroundings.

7D-021 The standard of road is commensurate with the recreation development level.

7D-022 Existing open public roads are maintained at or above current levels to provide for public access and safety.

Minerals

7D-023 These areas are suitable for federal oil and gas leasing with controlled surface use to protect the recreation resources and values. Other Federal minerals may be available on a case-by-case basis after full consideration of effects on recreation, scenery, and public safety.

7D-024 These areas are not available for mineral materials for commercial, personal, or free use purposes. Administrative use of mineral materials is allowed when: a) the materials are used within the recreation area itself; and b) use is necessary to protect the resources and values of the area.

Lands and Special Uses

7D-025 These areas are unsuitable for new linear rights-of-way, communication sites or commercial wind generation, with the exception that local electrical distribution lines are allowed. Other special uses are authorized if consistent and compatible with the goals and objectives of these areas.

7E - DISPERSED RECREATION AREAS

A number of developed recreation sites serve as gateways for dispersed recreation opportunities. In many cases, the developed recreation sites were developed to serve the needs of dispersed recreationists and protect resources. Interconnected trails and/or multiple loop trails provide opportunities for more concentrated dispersed recreation around or tangent to these recreation sites.

Dispersed Recreation Areas are divided into two Management Prescriptions based on their suitability for timber production. Most of the Dispersed Recreation Areas are in Management Prescription 7E1 which is unsuitable for timber production (approximately 24,000 acres). The Shaws Fork area and portions of the North River and Hidden Valley areas are in Management Prescription 7E2 (approximately 4,000 acres) which are suitable for timber production to facilitate the use of timber harvest to improve habitat for game species. The specific areas are as follows:

Table 4-11. High Density Dispersed Recreation Areas

Ranger District	Dispersed Recreation Area
North River	Brandywine (7E1)
	Hone Quarry (7E1)
	North River (7E1 and 7E2)
	Shaws Fork (7E2)
	Hogpen (7E1)
James River	Longdale (7E1)
	Children's Forest
Lee	Trout Pond (7E1)
	Elizabeth Furnace (7E1)
Pedlar	Sherando (7E1)
	Pedlar River (7E1)
	Crabtree Meadows (7E1)
	Shoe Creek (7E1)
	St. Mary's (7E1)
Warm Springs	Walton Tract (7E1)
	Hidden Valley (7E1 and 7E2)
	Lake Moomaw (7E1)

EMPHASIS

These are areas of non-formal camping and recreational use in various locations across the forest. These areas receive moderate to high recreation use and are managed to provide a variety of dispersed recreation opportunities, improve the settings for outdoor recreation, and enhance visitor experiences, in a manner that protects and restores the health, diversity, and productivity of the land.

DESIRED CONDITIONS FOR 7E - DISPERSED RECREATION AREAS

DC 7E-01: These areas are characterized by easy access and are capable of sustaining a relatively high number of recreationists in a manner that protects the surrounding water, soil, vegetation, and wildlife. Visitors enjoy the natural appearing landscape character of these settings and are able to choose from a wide variety of well-maintained nature-based recreation opportunities. High quality forest roads and well-marked trails through these areas provide easy access. Some trails are maintained to be universally accessible and will serve families with children, seniors, urban visitors and people with disabilities. Management is designed to meet the growing demands for pleasure driving, day hiking, mountain biking, horseback riding, dispersed

camping, backpacking, hunting, fishing, nature study, and nature photography and to showcase high quality scenery from travelways and concentrated use areas maintained through low intensity, planned management activities.

DC 7E-02: Trails through this area are well-marked and may include features for visitors with special access needs, loop systems, and/or interpretive programs. Facilities within these areas may include portable or permanent toilets, trash receptacles, fire grills, signs, or vehicle barriers; however, facilities are generally rare and are only provided for health and sanitation or to protect the area from resource damage.

DC 7E-03: The sights and sounds of other visitors and motorized vehicles are normally present. The opportunity to encounter other visitors is high along roadways, at parking areas, pullouts, and overlooks, but may be moderate to low on trails away from congregated use areas. Visitors are rarely challenged to rely on their own physical abilities and outdoor skills. Once away from open roads and trailheads, opportunities for solitude are available. In these more remote areas, visitors may take on some risk and be challenged to rely on their own personal physical abilities and primitive recreational skills such as bouldering, climbing, stream fording, and orienteering.

DC 7E-04: Roads are generally open to motorized activities. Non-motorized trails are maintained, improved, or expanded to meet local demands provided watershed and ecosystem health are not negatively affected. Limitations of use are implemented if any dispersed activity results in, or is expected to result in, negative affects to watershed or ecosystem health.

DC 7E-05: A mix of forest successional stages characterizes these areas. Infrequent pastoral and historic/cultural enclaves may also exist. From primary travelways and concentrated use areas, the valued character of these landscapes appears intact with no noticeable deviations.

DC 7E-06: Wildlife species associated with mid- to late-successional deciduous forest habitats and mixed landscapes are expected to inhabit these areas. These areas provide excellent opportunities for wildlife viewing and hunting.

DC 7E-07: Prescribed fire, wildfire, integrated pest management and commercial timber harvest are appropriate to manage vegetation. Wildland fires are used to restore and maintain historic fire regimes. Wildlife viewing opportunities are maintained and expanded through cultivation, mowing, and burning of openings and pastoral areas.

DESIRED CONDITIONS FOR 7E1 DISPERSED RECREATION AREAS – NOT SUITABLE FOR TIMBER PRODUCTION

DC 7E-08: These areas are not suitable for timber production. Openings may be maintained and some early successional habitat will be present from natural disturbances and fire.

DESIRED CONDITIONS FOR 7E2 DISPERSED RECREATION AREAS –SUITABLE FOR TIMBER PRODUCTION

DC 7E-09: Shaws Fork and the portions of North River and Hidden Valley that comprise this management prescription area are suitable for timber production in order to provide a greater diversity of wildlife habitats for hunting and wildlife viewing. Timber harvesting operations focus on what is retained in the forest, not on wood fiber production. Timber harvest is carefully timed and designed to be subtle. Group selections, individual tree selections, thinnings, and shelterwood harvests are predominately used.

STANDARDS FOR 7E - DISPERSED RECREATION AREAS

Terrestrial and Aquatic Species

7E-001 Existing old fields, wildlife openings, and other habitat improvements for fish and wildlife may be present and maintained, and expansion of openings or creation of new permanent openings of this type may occur. Native species are emphasized when establishing food plants for wildlife. Some openings provide permanent shrub/sapling habitat as a result of longer maintenance cycles.

7E-002 Wildlife and fisheries habitat improvements are allowed to enhance wildlife viewing, hunting, and fishing opportunities in accordance with scenic integrity objectives. Watchable wildlife species habitat improvements are encouraged.

Vegetation and Forest Health

7E-003 Native forest insect and disease outbreaks are controlled only to prevent unacceptable damage to resources on adjacent land or to protect threatened, endangered, and sensitive species. Non-native, invasive insects and diseases may be eradicated or suppressed to prevent a loss of the old growth community. Favor biological control methods.

7E-004 Eradicate non-native invasive plants when the infestations are isolated. Use approved hand-applied pesticides, when necessary.

7E-005 Allow vegetation management activities to:

- Enhance or rehabilitate scenery;
- Improve threatened, endangered, sensitive, and locally rare species habitat;
- Maintain rare communities and species dependent on disturbance;
- Reduce fuel buildups;
- Restore, enhance, or mimic historic fire regimes;
- Reduce insect and disease hazard;
- Control non-native invasive vegetation.
- Provide for public health and safety;
- Meet trail construction and maintenance needs;
- Maintain, enhance, or restore the diversity and complexity of native vegetation;
- Maintain recreation facilities, including roads and trails;

Timber Management – Areas Unsuitable for Timber Production - 7E1

7E-006 These lands are classified as unsuitable for timber production. Vegetation management may be accomplished with commercial timber sales as an appropriate method of reducing costs associated with these activities.

7E-007 Salvage of dead and dying trees is only allowed if the recreation resource is not impaired by the salvage operation.

Timber Management – Areas Suitable for Timber Production – 7E2 (Shaws Fork, Portions of North River and Hidden Valley)

7E-008 Timber production is a suitable use in these areas where hunting recreation and watchable wildlife are emphasized. Some portions of the area are identified as unsuitable for timber production as described in Appendix C.

7E-009 Even and uneven aged management systems are allowed, with an emphasis on group selection, thinning, two-aged and shelterwood treatments. Commercial thinning is commonly used to develop park-like stands and larger trees for aesthetic reasons.

Wildland Fire Management

7E-010 Vegetation management may be accomplished with wildfires and prescribed fire along with mechanical treatments as an appropriate method of reducing costs associated with these activities.

7E-011 Implement needed restorative measures to travelways and trails after wildfire and prescribed burning. Firelines are rehabilitated as soon as practicable.

Recreation

7E-012 New facilities such as trails, trailheads, toilets, and parking areas are allowed, but are considered on a case-by-case basis, commensurate with the public use of the area; existence of partnership(s) with user group(s) committed to providing long-term maintenance; air soil and water quality can be protected; and the new facility is deemed sustainable by the national forest.

Scenery

7E-013 Management activities are designed to meet or exceed the following Scenic Integrity Objectives:

Inventoried Scenic Class	1	2	3	4	5	6	7
Scenic Integrity Objectives	H	M	M	M	M	M	M

H=High; M=Moderate

7E-014 Management activities are designed to meet or exceed a High Scenic Integrity Objective in semi-primitive non-motorized areas within this prescription area.

Roads

7E-015 Existing open public roads are maintained at or above current levels to provide for public access and safety.

7E-016 All roads, facilities, and signing are designed to blend in with surroundings.

7F - BLUE RIDGE PARKWAY VISUAL CORRIDOR

The Blue Ridge Parkway was established June 30, 1936 as a recreation-oriented motor road connecting Shenandoah National Park in Virginia with the Great Smoky Mountains National Park in North Carolina. The Parkway itself is administered by the USDI National Park Service as an elongated park for public use and enjoyment through safe, uninterrupted, leisure motor travel, which provides for the conservation and interpretation of the natural and cultural resources of the Southern Appalachian Mountains. The Blue Ridge Parkway is known for spectacular mountain and valley vistas, quiet pastoral scenes, sparkling waterfalls, colorful wildflower and foliage displays, and its interpretation of mountain history and culture. There are approximately 4,000 acres in this management prescription area.

EMPHASIS

The emphasis of this management prescription is to manage National Forest System lands that can be seen from the Blue Ridge Parkway in a manner which positively contributes to the Parkway visitor's experience along this motorized national treasure. Views from Parkway overlooks appear natural and retain High to Very High scenic integrity.

DESIRED CONDITIONS FOR 7F - BLUE RIDGE PARKWAY VISUAL CORRIDOR

DC 7F-01: The Blue Ridge Parkway visual corridor provides exceptional opportunities for motorized recreation, including scenic driving. The views along the Parkway are natural appearing and include a variety of landscape characters, ranging from a continuous overstory canopy of large hardwoods and pines, to pastoral, cultural, rural, and suburban. Urban landscapes may be seen in the background from some scenic overlooks. In the foreground, understory vegetation and ground cover provide colorful accents and interesting textures for each season. 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. Forest management activities are not evident to the average visitor.

DC 7F-02: Vegetation is influenced both by natural processes and humans. Low intensity commercial timber harvest is appropriate to maintain the long-term goals of a diverse and vigorous forest with sensitivity to dispersed recreation and scenic values. Relatively longer rotation ages and a lower percentage of early successional forest in these areas reflect a low intensity approach to vegetation management and the higher priority of protecting the values of the Blue Ridge Parkway. Structural diversity within mixed mesophytic and dry-to-mesic oak forest communities is enhanced through commercial and non-commercial vegetation management activities. Up to 4% of forested land may be in early successional forest conditions created both naturally and purposefully. Timber harvesting operations focus on what is retained in the stand, not on wood fiber production. Timber harvest practices are modified to recognize the aesthetic and recreational values of these lands. Group selections, individual tree selections, thinnings, and light shelterwood harvests are predominately used. Clearcutting and shelterwood harvests leaving less than 35 square feet of basal area per acre are only used within areas seldom seen from the Parkway and its overlooks.

DC 7F-03: Prescribed fire, wildlife habitat improvements, and integrated pest management are also appropriate management tools to manage vegetation. Wildfires are managed in cooperation with the National Park Service using an appropriate management response to protect Parkway resources and visitor safety.

DC 7F-04: These areas are characterized by a predominance of mid- and late-successional forests with a high to intermediate tolerance to shade. Forest structure varies according to ecological factors, but largely consists of a mature overstory of hardwoods, occasionally mixed with pines, a fairly open midstory, and a well-developed herbaceous and shrubby understory. Understory vegetation includes a variety of native deciduous and evergreen flowering trees, shrubs and wildflowers. Even- and uneven-aged forest communities are managed throughout the area, along with continued development of medium and small patches of late successional to old growth forest communities. Up to 4% of forested land may be in early successional forest conditions created both naturally and purposefully when compatible with the scenic objectives of the Parkway corridor; however, no early successional habitat objectives are associated with this prescription. Wildlife

viewing opportunities are maintained and expanded through cultivation, mowing, and burning of openings and pastoral areas.

STANDARDS FOR 7F - BLUE RIDGE PARKWAY VISUAL CORRIDOR

General

7F-001 All management activities within this corridor must be compatible with maintaining, rehabilitating, or enhancing views from the Blue Ridge Parkway.

7F-002 Short-term scenic integrity objectives of rehabilitation and enhancement may be used until scenic integrity objectives are achieved.

Terrestrial and Aquatic Species

7F-003 Wildlife and fisheries habitat improvements are allowed to enhance wildlife viewing, hunting, and fishing opportunities in accordance with scenic integrity objectives. Watchable wildlife species habitat improvements are encouraged.

7F-004 Existing old fields, pastoral areas, and wildlife openings may be present and maintained. Expansion of existing openings and/or creation of new openings may occur. Non-invasive non-natives are sometimes used when establishing food plants for wildlife, but native species are preferred. Some openings provide permanent shrub/sapling habitats as a result of longer maintenance cycles.

7F-005 Up to 4% of this prescription area may be in early successional habitat conditions.

Vegetation and Forest Health

7F-006 Forest structure is managed to favor flowering trees and shrubs.

7F-007 Control insect and disease outbreaks, when necessary, to protect the scenic values, to reduce hazards to visitors, or for safety or legal reasons. Eradicate recently established non-native pests when possible. Favor the most effective control method.

7F-008 Allow vegetation management activities to:

- Maintain developed recreation facilities, including roads and trails;
- Enhance or rehabilitate scenery, including:
  - Create aesthetically desired stand structure and species composition including a pleasing mosaic of tree species of various densities and stem sizes, park-like effects, and enhancement of fall color species;
  - Feature flowering trees, character trees, and shrub species;
- Enhance both game and non-game wildlife habitat;
- Improve threatened, endangered, sensitive, and locally rare species habitat;
- Maintain rare communities and species dependent on disturbance;
- Reduce fuel buildups;
- Reduce insect and disease hazard;
- Control non-native invasive vegetation; or
- Provide for public health and safety.

7F-009 Salvage is allowed for scenic rehabilitation, fuel reduction, and to capture the economic value of dead, dying and diseased trees.

Timber Management

7F-010 Areas seldom seen from the Blue Ridge Parkway and its associated overlooks are suitable for timber production. The remainder of this corridor is unsuitable for timber production. Vegetation management may be accomplished with commercial timber sales as an appropriate method of reducing costs associated with these activities.

7F-011 Use even and uneven-aged silvicultural systems. Uneven-aged forest management (e.g. group selection, individual tree selection) practices are designed to result in forest structure and composition consistent with late-successional deciduous forest habitats over the long-term.

7F-012 Regeneration units range from 2 to 25 acres in size, clustered on the landscape.

7F-013 Regeneration harvest areas are primarily coppice with reserves with 15-25 square feet of basal area per acre left to ensure adequate sunlight for oak regeneration and two-aged silvicultural systems which leave 20-40 square feet of basal area per acre. In order to provide vertical diversity and future mast production, leave trees with a mean diameter of the codominant trees in the stand.

7F-014 Clearcut harvest systems occur when necessary to achieve specific wildlife habitat objectives. Thinning and group selection silvicultural systems are also employed to provide the structural diversity required by some species within this habitat association.

Wildland Fire Management

7F-015 Wildfires are managed in cooperation with the National Park Service using a response that will protect Parkway resources and visitor safety.

7F-016 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.

Recreation

7F-017 Interpretive services including trails, signs, viewing areas, and self-guided programs may be provided to enhance the understanding of, and appreciation for the natural environment, cultural resources, and the Parkway's special features.

Scenery

7F-018 Management activities are designed to meet or exceed the following Scenic Integrity Objectives:

Inventoried Scenic Class	1	2	3	4	5	6	7
Scenic Integrity Objectives	H	H	M	M	M	M	M

H=High; M=Moderate

Range

7F-019 Livestock grazing is not permitted.

Minerals

7F-020 The Blue Ridge Parkway corridor is suitable for federal oil and gas leasing with controlled surface use to protect the views and other values of the corridor. Other Federal minerals may be available on a case-by-case basis after full consideration of effects on scenic resources and other values.

7F-021 Permit mineral materials for commercial, personal, free, and administrative use purposes with conditions to protect the scenic resources and other values.

7F-022 Permit new borrow pits, provided they meet the scenic integrity objective. Rehabilitate or reclaim existing borrow pits that are currently not meeting the scenic integrity objective.

Roads

7F-023 Permit new access roads, provided they quickly enter and leave the seen area and do not parallel existing travelways.

7F-024 All roads, facilities, and signing are designed to blend in with surroundings.

7F-025 Density of open roads and/or motorized vehicle trails remains near the current level throughout the planning period, with only small increases or decreases.

Lands and Special Uses

7F-026 These areas are unsuitable for designation of new utility corridors, utility rights-of-way, communication sites or wind generation. Continue existing uses. Require necessary mitigation techniques, including screening, feathering, and other vegetation management techniques to mitigate the visual and other impacts of upgraded, utility corridors, or communication sites.

7F-027 Authorize other special uses if consistent and compatible with the goals and objectives of this area.

7G - PASTORAL LANDSCAPES

These areas are often associated with old farm lands. They are actively managed for a variety of wildlife species that need open canopies and open woodlands. They are also often important areas of dispersed recreation use, particularly those areas along major rivers. There are approximately 4,000 acres in this management prescription area.

EMPHASIS

The emphasis is on providing, through maintenance or restoration, high quality, generally open landscapes with a pastoral landscape character within a patchwork of forested areas. While the emphasis is on the open conditions, these areas also contain forested areas, including bottomland hardwoods. These landscapes provide important open grassland conditions for wildlife. These landscapes are frequently found in visually important travel corridors. Rangelands are also included in this area.

DESIRED CONDITIONS FOR 7G - PASTORAL LANDSCAPES

DC 7G-01: Visitors to these landscapes view and experience high quality pastoral scenery in a setting conducive to a variety of recreational experiences. These areas reflect a Rural Americana landscape character theme that represents remnants of a pleasant, peaceful, simple rural life. The backdrop for many of these areas is natural appearing forested landscapes or other similar privately owned pastoral landscapes. Human cultural modification is evident in the form of pastures, hedgerows, fencelines, farm paths, paved roads and dirt travelways, an occasional outbuilding, springhouse or barn all complementing the desirable pastoral landscape attributes of the rural setting. Grazing animals, such as cattle, horses, and sheep, are commonly observed. The predominantly grassy openings vary in size and shape as a result of traditional cultural land use patterns. Some exhibit straight-lined edges and others follow natural landforms and watercourses.

DC 7G-02: Recreation uses include pleasure driving, photography, watching wildlife, and participating in dispersed recreation such as picnicking, bird watching, horseback riding, hunting, and fishing. These areas are typically accessible by motor vehicle and some may have small parking areas or pullouts to allow visitors to stop and walk through the area. These areas provide important habitat for early successional species and watchable wildlife habitats. Examples include songbirds, woodpeckers, hummingbirds, butterflies, deer, rabbits, foxes, turkeys, waterfowl, and squirrels.

DC 7G-03: The sights and sounds of other visitors and motorized vehicles are common, but are moderated in areas away from congregated use areas. Visitors take on low risk and are not challenged to rely on their own physical abilities and outdoor skills. Facilities, though minimal, are designed to fit the character of the specific sites where they are located. Facilities might include pullouts, small parking areas, trailheads, bulletin boards, interpretive signage, fence stiles, rail, and other fences. Trails, if present, are generally of a low development scale and do not have hardened surfaces.

DC 7G-04: Vegetation consists predominantly of low grasses and wildflowers with some native deciduous and evergreen shrubs interspersed with an occasional tree, hedgerow, or small woodlot. For the most part the areas are on gently rolling terrain, some with exposed surface rock, rock outcrops, and meandering streams. Along the streams and rivers, bottomland forest trees are common.

DC 7G-05: Wildlife species associated with grassland, mixed habitats, and large rivers are expected to inhabit these areas. These areas provide excellent opportunities for wildlife viewing and hunting.

DC 7G-06: Sound range management practices and mowing help to maintain important old-field and grassland habitats and aesthetically pleasing pastoral settings. National forest grazing allotments demonstrate how innovative range management practices can maintain and restore vegetated riparian areas and stable streambanks within the range of natural variability. The national forest grazing program benefits local communities through assistance to small farmers.

STANDARDS FOR 7G - PASTORAL LANDSCAPES

Vegetation and Forest Health

7G-001 These non-forest areas are unsuitable for timber management, although occasional tree removal or herbicide use may be necessary to manage forest encroachment, provide scenic views, improve visitor safety, or encourage the presence of certain watchable wildlife species.

7G-002 Eradicate non-native invasive plants.

7G-003 Allow vegetation management activities to:

- Maintain grasses, wildflowers, and shrubby vegetation;
- Enhance or rehabilitate scenery;
- Improve threatened, endangered, sensitive, and locally rare species habitat;
- Maintain rare communities and species dependent on disturbance;
- Reduce fuel buildups;
- Restore, enhance, or mimic historic fire regimes;
- Reduce insect and disease hazard;
- Control non-native invasive vegetation;
- Provide for public health and safety;
- Meet trail construction and maintenance needs

Timber Management

7G-004 These lands are classified as unsuitable for timber production. Vegetation management may be accomplished with commercial timber sales as an appropriate method of reducing costs associated with these activities.

7G-005 Salvage of dead and dying trees is allowed.

Wildland Fire Management

7G-006 Prescribed fire and wildfires are allowed and managed to maintain pastoral and associated forest landscapes.

Recreation

7G-007 New facilities such as trails, trailheads, toilets, and parking areas are allowed.

7G-008 These corridors are unsuitable for designation of new All-Terrain Vehicle routes or use areas.

Scenery

7G-009 Management activities are designed to meet or exceed the following Scenic Integrity Objectives:

Inventoried Scenic Class	1	2	3	4	5	6	7
Scenic Integrity Objectives	H	H	M	M	M	M	M

H=High; M=Moderate

Range

7G-010 Grazing is permitted in order to maintain a pastoral setting on areas historically grazed or on open cultivated areas.

7G-011 Grazing is not permitted without an Allotment Management Plan (AMP). AMPs are reviewed annually and revised when necessary.

7G-012 Stocking of range allotments will not exceed the carrying capacity.

Roads

7G-013 All roads, facilities, and signing are designed to blend in with surroundings.

Lands and Special Uses

7G-014 New land acquisitions containing old farms and pastoral areas are often assigned this management prescription, although there is no objective to acquire these types of landscapes.

8E4 - INDIANA BAT HIBERNACULA PROTECTION AREAS

These areas are located around caves that are known to contain the Indiana bat (*Myotis sodalis*), a federally listed endangered species that occurs in several locations across western Virginia, where it is near the eastern edge of its global range. There are approximately 16,000 acres allocated to this management prescription area.

These Indiana bat "hibernacula" areas are divided into two areas: the Primary Cave Protection Area and the Secondary Cave Protection Area. A primary cave protection area consists of a radius of no less than one-half mile around each hibernaculum, defined by National Forest surface ownership and topography. This area is intended to protect the integrity of the cave and the immediate surrounding uplands where bats swarm and forage in the fall. A secondary cave protection area consists of a radius of approximately 1.5 miles around each primary cave protection area, defined by easily recognizable features on the ground. This area is designed to further maintain and enhance swarming, foraging, and roosting habitat. (Please note that the term "hibernacula" refers to caves in which bats hibernate and is used interchangeably with caves throughout this document. The singular form is hibernaculum.)

Indiana bats are known to be hibernating in four caves located on or near the George Washington National Forest. These prescription areas are intended to contribute to the goals of reversing population declines and reestablishing healthy populations of Indiana bats across the eastern United States. Management is based on the guidelines of the Indiana Bat Recovery Strategy for the George Washington and Jefferson National Forests (April, 1997).

Management activities are designed to: 1) protect hibernacula (caves in which the bats spend the winter); 2) maintain and enhance upland and riparian swarming and foraging areas; and 3) identify and protect summer roosting and maternity site habitat. The proposed conservation measures identified in the Indiana Bat Recovery Strategy for the protection and promotion of habitat for Indiana bats on the George Washington National Forest are applied at three scales:

1) A **primary cave protection area** as consisting of a radius of no less than one half mile around each hibernaculum, defined by national forest surface ownership and topography. This area is intended to protect the integrity of the cave and the immediate surrounding uplands where bats may swarm and forage in the fall.

2) A **secondary cave protection area** as consisting of a radius of approximately 1.5 miles around each primary cave protection area, defined by easily recognizable features on the ground. This area is designed to further maintain and enhance swarming, foraging, and roosting habitat.

3) Because Indiana bats are known to travel over 200 miles between winter and summer habitats, standards are also applied to the George Washington National Forest as a whole. These can be found specifically in the Chapter 2-Forestwide Direction, Indiana Bat Management. These standards are designed to protect foraging areas; non-cave associated roosts and maternity sites, if any are discovered on the Forest.

8E4a - INDIANA BAT PRIMARY CAVE PROTECTION AREAS

EMPHASIS

Within this prescription area, habitats are managed to maintain, restore, and enhance Indiana bat populations. Management of the primary cave protection area is focused on protecting the watershed of the cave along with maintaining and enhancing the surrounding environment where bats swarm, forage, and roost. Timber harvest is not appropriate within this prescription area. There are approximately 2,000 acres within primary cave protection areas.

DESIRED CONDITIONS FOR 8E4a - INDIANA BAT PRIMARY CAVE PROTECTION AREAS

DC 8E4a-01: This prescription area includes caves known to contain the Indiana bat, as well as the primary cave protection areas surrounding these hibernacula. Indiana bat hibernacula maintain winter temperatures between 39° and 50° F, and relative humidity above 54%. The hydrologic functioning, atmospheric conditions, and structural integrity of these caves are maintained. The ability of bats to enter, exit and move within hibernacula is unhampered. At a minimum, they are free from human disturbance from September 1 until June 1, when bats are hibernating and swarming. It is a long-term goal to acquire lands surrounding caves within the Forest's proclamation boundary that are known to contain the Indiana bat.

DC 8E4a-02: The landscapes of these areas predominately feature a structurally diverse older aged forest community with an open forested canopy. Grazed pastures are maintained and open woodlands may be restored through prescribed fire or wildfire management. These types of open habitats provide direct sunlight to roost trees and abundant Indiana bat prey. Cavity trees, cull trees, standing dead trees, storm and fire damaged live trees, and down logs are common throughout the area. Active roost trees are identified and protected from disturbance.

DC 8E4a-03: At least six roost trees that retain slabs of exfoliating bark, greater than nine inches in diameter, with at least some daily exposure to sunlight are provided per acre. Indiana bat movement and flight paths are not restricted by dense understory vegetation. Indiana bat prey, such as flying insects, is abundant in terms of both numbers of individuals and diversity of species.

DC 8E4a-04: Natural processes eventually result in large patches of late successional to old growth forests. Activities to benefit bat habitat are limited to management of forest visitors, prescribed fire, wild fire, domestic livestock grazing, selected non-commercial tree cutting, and integrated pest management to control non-native invasive species like gypsy moth and autumn olive. Gaps may occur naturally or purposefully to increase sunlight exposure on selected roost trees. No activities which could lead to disruption of the cave environment or the taking of an Indiana bat occur in this area.

DC 8E4a-05: Insects and diseases play a natural role in shaping future plant and animal species composition and successional stages across these areas; however, non-native vegetation occurs only as transients and is not self-perpetuating. Biological or species-specific pesticide controls of gypsy moth, hemlock woolly adelgid, and other non-native species are permitted with full consideration of the effects on the Indiana bat, their habitat, and their prey. Timber harvest and pesticide controls may be implemented to aid in the study of effects of non-native pests on the Indiana bat.

DC 8E4a-06: Drinking water sources are available in created upland or ridgetop ponds. Ponds typically adjoin mature forest and most have a flight corridor, such as a pasture, road or wildlife linear strip, leading into them. Existing wildlife openings may be maintained. Aside from Indiana bats, wildlife species associated with mid- to late-successional deciduous forest habitats that are expected to inhabit this area include: hooded warbler, southern pigmy shrew; whip-poor-will; least weasel, downy woodpecker; eastern gray squirrel; and orchard oriole. Because the landscapes in which this prescription lies, including private lands, are over 70% forest cover, one could also expect to find area-sensitive mid- to late-successional forest species including: ovenbird, cerulean warbler, black-billed cuckoo, and Swainson's warbler. This management prescription also provides suitable habitat for eastern wild turkey and black bear.

DC 8E4a-07: Low-impact (dispersed) recreational uses of these prescription areas are compatible with the long-term conservation of the Indiana bat. These include hiking, hunting, backpacking, picnicking, photography, and wildlife study. Spelunking may be allowed when the bats are not using the caves for hibernation. Existing trails and roads are used for access to specified areas for these activities, although decommissioning of existing roads may occur. Off-highway vehicle use is prohibited. Educational materials describing the Indiana bat, its geographical distribution, its habitat, fragility, and conservation efforts are readily available to visitors of the area. The Indiana bat is actively protected against collection and killing, except for specified scientific purposes authorized under permit. Trail and road reconstruction, minor relocation, and new parking facilities are permitted. All activities are conducted with full consideration of effects on Indiana bat populations.

8E4b - INDIANA BAT SECONDARY CAVE PROTECTION AREAS

EMPHASIS

Within this prescription area, habitats are managed to maintain, restore, and enhance Indiana bat populations. The goals of the secondary cave protection area are to maintain and enhance swarming, roosting, and foraging habitat and to involve regularly scheduled vegetation management activities to maintain and enhance mid- to late-successional oak-hickory forests, open woodland habitats, and the trees that are most likely to develop and retain slabs of exfoliating bark. Commercial timber harvest is frequently the most practical and economical method of achieving these goals. There are approximately 14,000 acres within secondary cave protection areas.

DESIRED CONDITIONS FOR 8E4b - INDIANA BAT SECONDARY CAVE PROTECTION AREAS

DC 8E4b-01: Management of the secondary cave protection area is focused on maintaining and enhancing swarming, roosting, and foraging habitat. The landscapes of these areas feature a structurally diverse older aged forest community with a forested canopy. Where ecologically suitable, open pine-oak woodlands with a mature overstory and grassy understory are restored. Oak-hickory forests are managed to favor trees which develop and retain slabs of exfoliating bark including: shagbark hickory, bitternut hickory, white ash, red oak, chestnut oak, white oak, red maple, sugar maple, black gum, sycamore, black locust, and southern yellow pines. Cavity trees, cull trees, standing dead trees, storm and fire damaged live trees, and down logs are common throughout the area. These areas contribute small patches of late-successional to old growth forests to the forestwide matrix. Active roost trees are identified and protected from disturbance. At least six roost trees that retain slabs of exfoliating bark, greater than nine inches in diameter, with at least some daily exposure to sunlight are provided per acre. Indiana bat movement and flight paths are not restricted by dense understory vegetation. Indiana bat prey, such as flying insects, is abundant in terms of both numbers of individuals and diversity of species.

DC 8E4b-02: Management activities designed to benefit bat habitat are used more frequently in the secondary cave protection area to maintain and enhance mid- to late-successional oak-hickory forests, open woodland habitats, and the trees that are most likely to develop and retain slabs of exfoliating bark. Additional trees with roosting potential are selected and sunlight conditions surrounding them are improved. Larger diameter snags with exfoliating bark are promoted and retained. Optimal foraging habitat with 50-70% canopy closure is provided to maximize both flying insect production and Indiana bat foraging success. Sixty percent of these areas are greater than 70 years of age, and 40% of the oak-hickory forest types are greater than 80 years of age. Structural diversity within mixed mesophytic and dry-to-mesic oak forest communities may be enhanced through commercial and non-commercial vegetation management activities.

DC 8E4b-03: Four to ten percent of the secondary cave protection area may be in early successional forest conditions to provide flight corridors and foraging habitat, provided other habitat objectives are also met. Drinking water sources are available in created upland or ridgetop ponds. Ponds typically adjoin mature forest and most have a flight corridor, such as a road or wildlife linear strip, leading into them. Existing wildlife openings are maintained along with occasional creation of new openings. Wildlife species associated with mid- to late-successional deciduous forest habitats and mixed landscapes that are expected to inhabit these areas include: hooded warbler, southern pigmy shrew; whip-poor-will; least weasel, downy woodpecker; eastern gray

squirrel; and orchard oriole. This management prescription also provides suitable habitat for ruffed grouse, eastern wild turkey and black bear. These areas provide excellent opportunities for wildlife viewing and hunting. Because the landscapes, in which this prescription lies, including private lands, are over 70% forest cover, one could also expect to find area-sensitive mid- to late-successional forest species including: ovenbird, cerulean warbler, black-billed cuckoo, and Swainson's warbler.

DC 8E4b-04: Non-native vegetation occurs only as transients and is not self-perpetuating. Biological or species-specific pesticide controls of gypsy moth, hemlock woolly adelgid, and other non-native species are permitted with full consideration of the effects on the Indiana bat, their habitat, and their prey. Timber harvest and pesticide controls may be implemented to aid in the study of effects of non-native pests on the Indiana bat.

DC 8E4b-05: Low-impact (dispersed) recreational uses of these prescription areas are compatible with the long-term conservation of the Indiana bat. These include hiking, hunting, backpacking, picnicking, photography, and wildlife study. Existing trails and roads are used for access to specified areas for these activities, although decommissioning of existing roads may occur. Off-highway vehicle use is prohibited. Educational materials describing the Indiana bat, its geographical distribution, its habitat, fragility, and conservation efforts are readily available to visitors of the area. The Indiana bat is actively protected against collection and killing, except for specified scientific purposes authorized under permit. Trail and road reconstruction, minor relocation, and new parking facilities are permitted. All activities are conducted with full consideration of effects on Indiana bat populations.

STANDARDS FOR 8E4 – INDIANA BAT HIBERNACULA PROTECTION AREAS

Forestwide standards for protection and management of the Indiana bat are supplemented in this prescription area by the following standards specific to cave-associated habitats.

When not specifically stated otherwise, these standards refer to both the primary (8E4a) and secondary (8E4b) cave protection areas.

Primary Cave Protection Areas

8E4-001 Each Indiana bat hibernaculum will have a primary buffer consisting of a radius of no less than one-half mile around each hibernaculum, defined by national forest surface ownership and topography.

8E4-002 No disturbance that will result in the potential taking of an Indiana bat will occur within this buffer.

- Commercial timber harvesting, road construction, use of the insecticide diflubenzuron, expansion or creation of permanent wildlife openings, and mineral exploration and development are prohibited.
- Prescribed burning, tree cutting, road maintenance, and integrated pest management using biological or species-specific controls are evaluated during project level analysis to determine the direct, indirect, and cumulative effects on Indiana bats and the hibernacula.

8E4-003 All currently known hibernacula are gated. If additional hibernacula are found, the caves are gated, if necessary, to protect Indiana bats during the critical hibernation period.

8E4-004 All caves may be opened for public use during the summer months for recreational use from June 1 to September 1.

Secondary Cave Protection Areas

8E4-005 A secondary buffer consisting of a radius of approximately 1.5 miles around each primary cave protection area, defined by easily recognizable features on the ground, will have limited disturbance.

8E4-006 Within the secondary cave protection area, the following management activities can occur following evaluation to determine the direct, indirect, and cumulative effects on Indiana bats and the hibernacula:

- Regeneration timber sales;
- Thinning;
- Road construction or reconstruction;
- Prescribed burning;
- Trail construction or reconstruction;
- Special uses; and
- Biological or species-specific pesticide use.

Active Maternity Site Protection

8E4-007 If active maternity roost sites are identified on the Forest, they are protected with a 2.5-mile buffer defined by the maternity roost, alternate roost sites, and adjacent foraging areas. See Forestwide standards.

Active Roost Tree Protection

8E4-008 As active roost trees are identified on the Forest, they are protected with a quarter-mile buffer surrounding them. This protective buffer remains until such time they no longer serve as a roost (e.g. loss of exfoliating bark or cavities, blown down, or decay). See Forestwide standards.

Terrestrial and Aquatic Species

8E4-009 Management for other plant and animal species within the primary cave protection areas is evaluated during project level analysis to determine the direct, indirect, and cumulative effects on Indiana bats and the hibernacula.

8E4-010 Opportunities should be sought to include creation of drinking water sources for bats in project plans, where appropriate, in areas where no reliable sources of drinking water are available. Opportunities are considered when the creation is not detrimental to other wetland-dependent species (i.e., damage to natural springs and seeps).

8E4-011 Limit creation of early successional habitat to 10 percent of forested acres in the secondary cave protection area. Creation of early successional habitat in the primary cave protection area is prohibited.

8E4-012 Existing old fields, wildlife openings, and other habitat improvements for fish and wildlife may be present and maintained within both the primary and secondary cave protection areas, but no expansion of openings or creation of new permanent openings of this type occurs within the primary cave protection area. Native species are emphasized when establishing food plants for wildlife. Some openings provide permanent shrub/sapling habitat as a result of longer maintenance cycles.

8E4-013 Structural habitat improvements for fish and other aquatic species are allowed.

Threatened, Endangered and Sensitive Species

8E4-014 Management for other known populations of threatened, endangered, sensitive, and locally rare species within the primary cave protection areas are evaluated during project level analysis to determine the direct, indirect, and cumulative effects on Indiana bats and the hibernacula.

Vegetation and Forest Health

8E4-015 Allow vegetation management activities within primary cave protection areas to:

- Promote trees that retain slabs of exfoliating bark;
- Promote large diameter roost trees with some daily exposure to sunlight;
- Thin dense midstories that restrict bat movement;
- Improve other threatened, endangered, sensitive, and locally rare species habitat;
- Maintain rare communities and species dependent on disturbance;
- Reduce fuel buildups;
- Restore historic fire regimes, particularly in pine and pine-oak woodlands;
- Reduce insect and disease hazard to oak-hickory forest communities;
- Control non-native invasive vegetation;
- Maintain trails

8E4-016 Allow vegetation management activities within secondary cave protection areas to:

- Maintain oak-hickory forest communities; and restore pine and pine-oak woodlands;
- Promote trees that retain slabs of exfoliating bark;
- Promote large diameter roost trees with some daily exposure to sunlight;
- Thin dense midstories that restrict bat movement;
- Improve other threatened, endangered, sensitive, and locally rare species habitat;
- Maintain rare communities and species dependent on disturbance;
- Reduce fuel buildups;
- Restore, enhance, or mimic historic fire regimes;
- Reduce insect and disease hazard;
- Control non-native invasive vegetation;
- Salvage dead and dying trees as a result of insects, diseases, or other natural disturbance events;
- Provide up to 10% early successional habitat conditions;
- Maintain trails

8E4-017 Strive for optimum roosting habitat of 16 or more Class 1 and/or Class 2 trees greater than 9 inches diameter at breast height (dbh) per acre, as averaged across the prescription area associated with each hibernaculum. Class 1 trees are those species which are most likely to have exfoliating bark either in life or after death, and which are most likely to retain it for several years after they die. Class 2 trees characteristically have exfoliating bark as well, but are considered to be of slightly lower quality than Class 1 trees.

Class 1 Trees	Class 2 Trees
Carya cordiformis (bitternut hickory)	*Acer rubrum* (red maple)
Carya laciniosa (shellbark hickory)	*Acer saccharum* (sugar maple)
Carya ovata (shagbark hickory)	*Aesculus octandra* (yellow buckeye)
Fraxinus americana (white ash)	*Betula lenta* (sweet birch)
Fraxinus pennsylvanica (green ash)	*Carya glabra* (pignut hickory)
Quercus alba (white oak)	*Carya* spp. (other hickories)
Quercus prinus (chestnut oak)	*Fagus grandifolia* (American beech)
Quercus rubra (red oak)	*Liriodendron tulipifera* (tulip poplar)
Quercus stellata (post oak)	*Nyssa sylvatica* (black gum)
Ulmus rubra (slippery elm)	*Platanus occidentalis* (sycamore)
	Robinia pseudoacacia (black locust)
	Quercus coccinea (scarlet oak)
	Quercus velutina (black oak)
	Sassafras albidum (sassafras)
	Pinus echinata (shortleaf pine)
	Pinus virginiana (Virginia pine)
	Pinus rigida (pitch pine)
	Pinus pungens (table mountain pine)

Timber Management

8E4-018 Primary cave protection areas are unsuitable for timber production. Commercial timber harvest is not allowed.

8E4-019 Secondary cave protection areas are suitable for timber production. Some portions of the areas are identified as unsuitable for timber production due to the timber suitability analyses in Appendix C.

The remainder of the Timber Management standards under this section refers only to the Secondary Cave Protection Areas.

8E4-020 Clearcutting is prohibited.

8E4-021 In order to promote fall foraging and swarming areas, timber activities will leave all shagbark hickory trees and retain a minimum average of 6 snags or cavity trees (greater than or equal to 9 inches diameter at breast height, dbh) per acre as potential roost sites (except where they pose a safety hazard). For the group selection harvest method, all shagbark hickories are maintained (except where they pose a safety hazard) with no provision for minimum number of snags or cavity trees due to the small opening size.

8E4-022 Forested communities are maintained using either of two following criteria:
A minimum of 60% of the acreage of all Forest Types are maintained over 70 years of age; and a minimum of 40% acreage of FSVEG Forest Types 53 (white oak, red oak, hickory) and 56 (yellow poplar, white oak, red oak) are maintained at an age greater than 80 years old;

OR

When the above age criteria cannot be met, forest stands receiving even-aged regeneration harvesting are maintained with a minimum of 20 trees per acre in the 10-16 inch dbh class and 15 trees per acre in the greater than 16 inch dbh class, of which two trees per acre must be 20 inches dbh or greater.

8E4-023 The 0 - 10 age class will not exceed 10% at any time (regardless which of the criteria above are used).

8E4-024 Timber marking and harvesting crews will receive training in the identification of potentially valuable roost trees.

8E4-025 Timber harvesting operations will be suspended from September 15 until November 15.

Non-timber Forest Products

8E4-026 Do not issue authorizations for the commercial or personal use of any forest products, including firewood.

Wildland Fire Management

8E4-027 Prescribed burning and wildfires are allowed to manage vegetation to maintain flight and foraging corridors in upland and riparian areas potentially used by bats in the summer.

Recreation

8E4-028 Maintain trails to the minimum standard necessary for protection of the soil, water, vegetation, visual quality, user safety, and long-term maintenance.

8E4-029 New trail construction is allowed only within the secondary cave protection area.

Scenery

8E4-030 Management activities are designed to meet or exceed the following Scenic Integrity Objectives:

Inventoried Scenic Class	1	2	3	4	5	6	7
Scenic Integrity Objectives	H	M	M	M	M	M	M

H=High; M=Moderate

8E4-031 Management activities are designed to meet or exceed a High Scenic Integrity Objective in semi-primitive non-motorized areas within this prescription area.

Minerals

8E4-032 The primary cave protection areas are not suitable for oil and gas and other Federal leasable minerals. These areas are not available for mineral materials for commercial, personal, or free use purposes. Administrative use of mineral materials is allowed when: a) the materials are used within the primary cave protection area itself; and b) use is necessary to protect Indiana bat habitat.

8E4-033 Within the secondary cave protection areas, areas are suitable for federal oil and gas leasing with a no surface occupancy stipulation to protect Indiana bat habitat. Other Federal minerals are allowed on a case-by-case basis after full consideration of effects on Indiana bat habitat. Permit mineral materials for commercial, personal, free, and administrative use purposes with conditions to protect Indiana bat habitat. Seismic exploration would only be allowed during periods of time when Indiana bats are not hibernating.

Roads

8E4-034 Within the primary cave protection area, do not permit road construction, subject to valid existing rights or leases. Road reconstruction and minor relocation are permitted to benefit the Indiana bat and its habitat.

8E4-035 New construction and reconstruction are allowed in the secondary cave protection area.

8E4-036 Decommission roads when they are adversely affecting caves, their hydrology, or Indiana bat habitat security.

Lands and Special Uses

8E4-037 Primary cave protection areas are unsuitable for new special uses, except for research and outfitter-guide operations. Phase out existing non-conforming uses.

8E4-038 Allow commercial use by outfitters and guides if compatible with preservation of the primary cave protection areas. Do not allow contest events such as foot races or horseback endurance events. Require outfitters and guides to use leave-no-trace techniques. Do not allow permanent camps.

8E4-039 Within secondary cave protection areas, new special use proposals are analyzed on a case-by-case basis to determine the potential effects on the Indiana bat.

8E4-040 Both the primary and secondary cave protection areas are unavailable for wind energy development.

8E7 - SHENANDOAH MOUNTAIN CREST

Nearly the entire known range of the Cow Knob salamander (*Plethodon punctatus*) occurs on the George Washington National Forest. This area is located on the North River Ranger District along the crest of Shenandoah Mountain and Great North Mountain, largely above 3,000 feet elevation. Cow Knob salamanders typically reach their highest population densities in older age hardwood forests with abundant large down wood and rock. The U.S. Fish and Wildlife Service and the George Washington National Forest were the first federal agencies in the Nation to enter into a Conservation Agreement in 1994, under a multi-agency Memorandum of Understanding, designed to keep an at-risk species from needing to be listed under the Endangered Species Act. This Conservation Agreement, and accompanying Habitat Conservation Assessment, serves as the guide for management of the Cow Knob salamander. There are approximately 24,000 acres allocated to this management prescription area. Another 23,000 acres of the area established in the Conservation Agreement are located within the recommended National Scenic Area and about 11,000 acres are allocated to Wilderness, Recommended Wilderness Study or Research Natural Areas.

A variety of threatened, endangered, and sensitive species and unique natural communities occur on Shenandoah Mountain. This includes at least 15 species of plants and 13 species of animals plus their associated habitats. This area includes the following Virginia Division of Natural Heritage Conservation sites: Cow Knob, Laurel Run, Middle Mountain, and portions of Bother Knob/High Knob, Little Bald Knob, and Reddish Knob.

EMPHASIS

This large area is managed to protect and/or enhance habitat for the Cow Knob salamander and for other outstanding natural biological values. The protection, maintenance and restoration of species, natural communities and ecological processes are the primary objectives. Management of the biological resources coexists with dispersed recreation activities as well as other wildlife management activities that are compatible.

DESIRED CONDITIONS FOR 8E7 - SHENANDOAH MOUNTAIN CREST

DC 8E7-01: Vegetation types influenced by the natural environmental and ecological processes dominate the landscape. Restoration and maintenance of certain vegetation communities are permitted through prescribed burning or other proven means of controlling natural succession. Inholdings and adjacent lands are acquired as opportunities arise and are considered a priority for acquisition.

DC 8E7-02: Within this area, habitats are managed to maintain or enhance Cow Knob salamander populations and populations of other threatened, endangered, sensitive, and locally rare (TESLR) species, including the Shenandoah Mountain salamander. The landscape character of this area generally consists of a closed forest canopy of late-successional stages of mixed hardwoods on upper slopes combined with coves and riparian areas with eastern hemlock, tulip poplar, and rhododendron thickets. Within this matrix of mostly closed canopy forest is a mosaic of dry oak and yellow pine woodlands in a wide variety of successional stages and structural conditions, with a south to west aspect. Abundant ground cover in the form of rocks, down and decaying logs, and leaf litter are maintained and restored. Open grassy, shrubby areas and areas without vegetation, like roads, trails, and utility rights-of-way are minimized, except where desired for certain TESLR species and ecological systems. The landscape of the area retains a natural, forested appearance, and the valued character of the natural evolving landscape is intact with no noticeable deviations. The mix of forest communities varies by landtype association, including mixed mesophytic and mesic oak hickory forests dominated by red, white, chestnut, and black oaks, as well as tulip poplar, sugar and red maples, and hemlocks. The overstory is generally closed in forested conditions with minimal sunlight reaching the forest floor; however, naturally occurring brushy and herbaceous openings may occasionally be found. Natural processes eventually result in a large patch old growth forest matrix throughout much of the area. Cavity trees, standing dead trees, and down logs are common throughout the entire area as a result of natural mortality combined with gypsy moth killed trees. All forested blocks are interconnected by corridors which themselves have a continuous forest cover. Wildlife species associated with area-sensitive mid- to late-successional deciduous forest habitats are expected to inhabit this area.

DC 8E7-03: This habitat conservation area is unsuitable for timber production and commercial timber harvest. Removal of non-native vegetation is considered appropriate. Sufficient canopy trees and large woody debris on the forest floor are maintained to reduce drying of subsurface soils. Biological pesticide controls of gypsy moth, hemlock woolly adelgid, and other detrimental species are permitted with full consideration of the effects on the salamanders, TESLR species, their microhabitat, and their prey.

DC 8E7-04: The role of fire in maintaining some natural communities within this area is recognized as an important management tool. Management will include prescribed fire and wildfires on drier sites supporting rare plants and unique natural communities, including woodlands. Generally, fires occur predominately on drier sites where the Cow Knob salamander is absent. Therefore, fires on dry sites supporting rare plants and unique natural communities appear to be compatible with salamander conservation. Wildfires are managed under conditions to create or maintain habitat needed by TESLR species and rare communities where appropriate. Fire suppression efforts will use the least impact methods available to manage the fire.

DC 8E7-05: Low-impact (dispersed) recreational uses of the area are compatible with the long-term conservation of the Cow Knob salamander. These include hiking, hunting, backpacking, picnicking, photography, and wildlife study. Existing trails and roads are used for access to specified areas for these activities, although decommissioning of existing roads may occur. Mountain bike and horse riding occur only on designated roads and trails. The Cow Knob salamander is actively protected against collection and killing, except for specified scientific purposes. Limited access is provided through portions of the area on Forest Service and State roads with gravel, native, and occasionally paved surfaces. The opportunity to encounter other visitors is high along the roads and at parking areas, pull-outs, and overlooks. Forest visitors on foot, horse, or bicycles experience solitude in portions of this prescription area away from roads. Comfort, sanitation, and camping facilities on Forest Service lands are not provided, although primitive camping can be enjoyed throughout the area. During most of the year, occasional encounters with other forest visitors can be expected; however these encounters are more frequent during spring and fall hunting seasons. Visitors to this area see examples of the natural communities of Shenandoah Mountain. This includes various old growth forest types as well as a mosaic of grass and fern dominated openings with scattered trees along the very crest of Shenandoah Mountain. Dispersed recreation opportunities are provided when in harmony with the special biological values of the area. Mountaintop vistas such as Reddish Knob Observation Site and Flagpole Knob provide sweeping views of the Shenandoah Valley.

DC 8E7-06: Management activities limit negative impacts to Cow Knob salamander populations from permanent and long-term fragmentation, isolation, and edge effects (such as drying from increased insolation, impacts from edge predators, invasion of non-native invasive plants, and increased competition from other salamander species). No new permanent roads are constructed. Restoration of canopy and cover along temporary and decommissioned roads occurs quickly. Canopy closure along road rights-of-way is common. New trails may be constructed if no adverse effect on Cow Knob salamander populations will occur. Trail and road reconstruction, minor relocation, and new parking facilities are permitted. All activities are conducted with full consideration of effects on Cow Knob salamander populations.

STANDARDS FOR 8E7 - SHENANDOAH MOUNTAIN CREST

Terrestrial and Aquatic Species

8E7-001 Watershed improvement projects are developed and implemented on areas where erosion is human-caused, but not normally undertaken in response to natural processes occurring on the area.

8E7-002 Maintenance or creation of wildlife habitat improvements is allowed except for those activities that would negatively impact Cow Knob salamander habitat.

8E7-003 The creation of new edge habitat for management of game species should be minimized, and is allowed as a wildlife management tool only in areas of habitat unsuitable for the Cow Knob salamander.

8E7-004 Vegetation may be manipulated for the management of the biological values identified as well as threatened, endangered, or sensitive species and their habitat.

Vegetation and Forest Health

8E7-005 Native forest insect and disease outbreaks are controlled only to prevent unacceptable damage to resources on adjacent land or to protect threatened, endangered, sensitive, or locally rare species. Non-native, invasive insects and diseases may be eradicated or suppressed to prevent a loss of the special biological community. Favor biological control methods.

8E7-006 Control or eradicate non-native invasive plants using hand-applied herbicides, with Forest Supervisor approval, when necessary.

8E7-007 Control non-native invasive animals, insects, and diseases where they are causing negative effects to rare communities. Do not introduce non-native species in or near rare communities, unless it is a natural enemy of a non-native pest.

Timber Management

8E7-008 These lands are classified as unsuitable for timber production.

8E7-009 Salvage of dead or dying trees using ground-based systems may occur for safety or scenic rehabilitation along open road systems.

8E7-010 Cutting of insect damaged, wind thrown, and fire killed trees which pose a safety or maintenance concern, may be conducted within 100 feet of the center of existing open roads. Non-commercial firewood cutting may be permitted with this same corridor, but only following salamander surveys indicating the area is not of significance to the Cow Knob salamander.

Non-timber Forest Products

8E7-011 Do not permit the collection of non-timber forest products, except for scientific purposes as permitted by the Forest Supervisor.

Wildland Fire Management

8E7-012 Vegetation management may be accomplished with wildland fire management.

8E7-013 New plow lines for containing prescribed burns in or near bogs and seasonal ponds are prohibited to avoid disrupting hydrology. Use existing roads, firelines, or streams to contain burns where possible. Favor construction of new firelines by using less intensive methods such as wetline, handline, and cutting back flashy fuels. Heavy mechanized equipment (e.g. bulldozers and tractors) may be used only if compatible with the values for which the management prescription area was created.

Recreation

8E7-014 Modify recreation sites or trails to reduce or eliminate negative effects where recreational uses are negatively affecting threatened, endangered, sensitive, and locally rare species. New and improved recreational developments are designed to avoid adverse effects to threatened, endangered, sensitive, and locally rare species.

8E7-015 These areas are unsuitable for designation as All-Terrain Vehicle use areas.

8E7-016 Where appropriate, interpretive services (trails, signs, viewing areas) are provided to enhance visitors' understanding and appreciation of the area's special values.

8E7-017 Trails and other recreation facilities are located to minimize impacts occurring to the natural values of the established area.

8E7-018 Vistas and associated turn-outs may be maintained or increased where compatible with biological values.

Scenery

8E7-019 All management activities will meet or exceed a Scenic Integrity Objective of High.

Minerals

8E7-020 These areas are suitable for federal oil and gas leasing with a no surface occupancy stipulation to protect threatened, endangered, sensitive, and locally rare species. Other Federal minerals may be available on a case-by-case basis after full consideration of effects on threatened, endangered, sensitive, and locally rare species.

8E7-021 Permit mineral materials for commercial, personal, free, and administrative use purposes with conditions to protect threatened, endangered, sensitive, and locally rare species habitat.

8E7-022 Private mineral rights exist in some of these areas. Roads, wells, and other necessary infrastructure associated with these rights are allowed. Requests for access to a non-Federal interest in lands pursuant to a reserved or outstanding right are recognized, and reasonable access is granted. Encourage such interests to minimize disturbance to threatened, endangered, sensitive, and locally rare species habitat.

Roads

8E7-023 Only permit road construction to access valid existing rights and mineral leases.

8E7-024 Existing roads may be maintained. Construction of new roads of any kind is not permitted in the management prescription area.

8E7-025 Reconstruction, minor relocation and construction of parking facilities are permitted where compatible with biological values.

Lands and Special Uses

8E7-026 These areas are unsuitable for designation of new utility corridors, utility rights-of-way, or communication sites unless there is an over-riding demonstrated public need or benefit. Existing uses may continue unless removal is necessary to protect threatened, endangered, sensitive, and locally rare species.

8E7-027 These areas are unsuitable for wind energy development.

8E7-028 Allow commercial use by outfitters and guides if compatible with preservation of the rare community values. Contest events such as foot races or horseback endurance events are generally discouraged, but can be considered on a case-by-case basis. Require outfitters and guides to use leave-no-trace techniques. Do not allow permanent camps.

8E7-029 Vegetation within existing corridors is maintained in a grass/shrub type by mowing, hand cutting or use of selective herbicide treatments.

Additional Direction

8E7-030 The following standards will apply to the portion of the Shenandoah Mountain Crest within the Shenandoah Mountain Remote Backcountry Area as displayed in Appendix I.

Timber may be cut, sold, or removed if one of the following circumstances exists. The cutting, sale, or removal of timber in these areas is expected to be infrequent.

(1) 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 remote area characteristics;
  (i) To improve threatened, endangered, proposed, or sensitive species habitat; or
  (ii) To maintain or restore the characteristics of ecosystem composition and structure, such as to reduce the risk of uncharacteristic wildfire effects, within the range of variability that would be expected to occur under natural disturbance regimes of the current climatic period;
(2) The cutting, sale, or removal of timber is incidental to the implementation of a management activity not otherwise prohibited; or
(3) The cutting, sale, or removal of timber is needed and appropriate for personal or administrative use.

Roads may not be constructed or reconstructed unless:

(1) 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 or property;
(2) A road is needed to conduct a response action under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) or to conduct a natural resource restoration action under CERCLA, Section 311 of the Clean Water Act, or the Oil Pollution Act;
(3) A road is needed pursuant to reserved or outstanding rights, or as provided for by statute or treaty;
(4) 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 or private access, natural resource management, or public health and safety;
(5) 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;
(6) 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
(7) 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 and resource management plan direction, regulations, and laws. 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.

11 - RIPARIAN CORRIDORS – STREAMS, LAKES, WETLANDS, AND FLOODPLAINS

Riparian Areas are functionally defined as areas with three-dimensional ecotones of interaction that include both terrestrial and aquatic ecosystems. They extend down into the groundwater, up above the canopy, outward across the floodplain, up the near-slopes that drain into the water, laterally into the terrestrial ecosystem, and along the watercourse at a variable width. For an operational definition of a riparian area based on soils, vegetation, and hydrologic characteristics see Appendix A. A *riparian corridor* is a management prescription area designed to include much of the Riparian Area. Within the riparian corridor management prescription area, management practices are specified to maintain riparian functions and values. As a management prescription area, this includes corridors along all defined perennial and intermittent stream channels that show signs of scour, and around natural ponds, lakeshores, wetlands, springs, and seeps. See Appendix A for a graphical representation of a riparian corridor. There are approximately 51,000 acres of floodplains, wetlands, and riparian areas allocated to this management prescription area but because these acres are intricately embedded within other areas, they are not mapped on the Management Prescription Area map associated with this Forest Plan.

EMPHASIS

Riparian corridors are managed to retain, restore, and/or enhance the inherent ecological processes and functions of the associated aquatic, riparian, and upland components within the corridor. Primarily, natural processes (floods, erosion, seasonal fluctuations, etc.) modify most of the areas within the riparian corridor. However, management activities may be used to provide terrestrial or aquatic habitat improvement, favor recovery of native vegetation, control insect infestation and disease, comply with legal requirements (e.g. Endangered Species Act, Clean Water Act), provide for public safety, and to meet other riparian functions and values. Silvicultural treatments including timber and vegetation removal may occur to restore and/or enhance riparian resources such as water, wildlife, and natural communities.

DESIRED CONDITIONS FOR 11 - RIPARIAN CORRIDORS

DC 11-01: Riparian corridors reflect the physical structure, biological components, and ecological processes that sustain aquatic, riparian, and associated upland functions and values. The preferred management for riparian corridors is one that maintains, or moves toward, the restoration of processes that regulate the environmental and ecological components of riparian areas. However, due to the high value that these areas have for many uses, evidence of human activity (developed recreation areas, roads and trails, dams and reservoirs, and pastoral areas) may be present.

DC 11-02: Riparian corridors are managed to emphasize the maintenance, restoration, and enhancement of habitat for species that depend on riparian resources for at least a part of their life-cycle. Management may also occur to maintain, restore, or enhance habitat for other species that benefit from riparian resources as long as the needs of species that depend on riparian resources for at least a part of their life-cycle are met.

DC 11-03: The soils of riparian corridors have an organic layer (including litter, duff, and/or humus) of sufficient depth and composition to maintain the natural infiltration capacity, moisture regime, and productivity of the soil (recognizing that floods may periodically sweep some areas within the floodplain of soil and vegetation).

DC 11-04: Exposed mineral soil and soil compaction from human activity may be present but are dispersed and do not impair the productivity and fertility of the soil. Any human-caused disturbances or modifications that cause environmental degradation through concentrated runoff, soil erosion, or sediment transport to the channel or waterbody are promptly rehabilitated or mitigated to reduce or eliminate impacts.

DC 11-05: Trees within the corridors are managed to provide sufficient amounts and sizes of woody debris to maintain habitat complexity and diversity for aquatic and riparian wildlife species. Recruitment of woody debris typically occurs naturally; however, woody debris may be purposefully introduced to enhance aquatic and

terrestrial habitat. Both in-stream and terrestrial woody debris are regarded as essential and generally left undisturbed.

DC 11-06: The riparian corridor functions as a travelway for aquatic and terrestrial organisms. The corridor serves as a connector of habitats and populations allowing gene flow to occur, thus keeping populations genetically viable.

DC 11-07: Stream structures, such as bridges, culverts, and aquatic habitat improvement structures, may be evident in some streams and waterbodies. With the exception of some dams, most structures do not decrease in-stream connectivity.

DC 11-08: Suitable habitat is provided in the riparian corridor for riparian flora and fauna; especially threatened, endangered, sensitive (TES) and locally rare species. Vegetation (dead and alive) reflects the potential natural diversity of plant communities with appropriate horizontal and vertical structure needed to provide the shade, food, shelter, and microclimate characteristics for aquatic and terrestrial species. Rehabilitation of past and future impacts (both natural and human-caused) may be necessary to protect resource values and facilitate recovery of riparian structure and functions.

DC 11-09: Vegetative communities within the riparian corridor are diverse and productive, providing for a rich variety of organisms and habitat types. The vegetative community within the riparian corridor is predominately forested; however, some native non-forested communities such as wet meadows and grass or shrub dominated plant communities may occur. The desired vegetative condition of non-forested communities is determined by site-specific analysis.

DC 11-10: The forest contains multiple canopy layers, which provide diverse habitat structure, and thermal and protective cover for wildlife. Snags used by birds, bats, and other small animals are abundant. Dying and down trees are common, often in naturally occurring patches. Wet meadows, non-forest communities, and open forest canopies, created by flooding, wind damage, wildland fire, insect infestations, disease, restoration, and vegetation management may be seen.

DC 11-11: Vegetation management activities are stratified into two sections of the riparian corridor. The core of the corridor is the area within 100 feet each side of perennial streams, lakes, ponds and wetlands and the area within 50 feet each side of intermittent streams. Within the core of the riparian corridor, vegetation management activities, including prescribed fire, may take place to maintain, restore, and/or enhance the diversity and complexity of native vegetation, rehabilitate both natural and human-caused disturbances, and provide habitat improvements for aquatic and riparian- associated wildlife species (including migratory birds), provide for visitor safety, or to accommodate appropriate recreational uses. Silvicultural treatments, including timber and vegetation removal, may occur within the riparian corridor, but the corridor will be classified as not suitable for timber production. When slopes exceed ten percent, the riparian corridor is extended beyond the core area. Within this extended portion of the corridor vegetation management activities may take place to meet the objectives of the adjacent management prescription. However, these activities will be constrained by the standards in this riparian corridor prescription. Silvicultural treatments, including timber and vegetation removal, may occur within the extended section of the corridor. This extended section of the corridor can be classified as suitable for timber production if the adjacent management prescription is suitable. Prescribed fire can be used within the corridor to create or maintain the composition and vitality of fire-dependent vegetative communities.

DC 11-12: The landscape character is natural evolving or natural appearing, but occasional enclaves of a rural landscape character may occur with pastoral settings and recreation developments (such as a swim beach at a campground). Livestock grazing may occur, but it is managed to minimize impacts on stream banks, water quality, and other riparian resources.

DC 11-13: Both dispersed and developed recreation opportunities may be present within these corridors. Although recreational areas and facilities may create long-term impacts on riparian corridors, allowances are made in this prescription since a majority of recreation within the national forests occurs in or near water bodies.

DC 11-14: Hiking, dispersed camping, hunting, and fishing are typical activities available within the corridor. Visitors may encounter developed camping areas, boat launches and fishing piers. Current recreation areas and facilities are managed to minimize impacts on stream banks, shorelines, and water quality. New recreation facilities will be developed in accordance with Executive Orders 11988 and 11990 to minimize impacts on the riparian resource. Environmental education and interpretation about the aquatic component and riparian corridor may be provided to increase awareness of the value of riparian resources.

DESIRED CONDITIONS FOR AQUATIC SYSTEMS WITHIN THE RIPARIAN CORRIDOR

DC 11-15: Streams are in dynamic equilibrium; that is, stream systems normally function within natural ranges of flow, sediment movement, temperature, and other variables. The geomorphic condition of some channels may reflect the process of long-term adjustment from historic watershed disturbances (e.g. past intensive farming or logging practices). The combination of geomorphic and hydrologic processes creates a diverse physical environment, which, in turn, fosters biological diversity. The physical integrity of aquatic systems, stream banks and substrate, including shorelines and other components of habitat is intact and stable. Where channel shape is modified (e.g. road crossings), the modification preserves channel stability and function.

DC 11-16: The range of in-stream flows is maintained to support channel function, aquatic biota and wildlife habitat, floodplain function, and aesthetic values. Water uses and other modifications of flow regimes are evaluated in accordance with the national Forest Service in-stream flow strategy and site-specific analysis.

DC 11-17: Water quality remains within a range that ensures survival, growth, reproduction, and migration of aquatic and riparian wildlife species; and contributes to the biological, physical, and chemical integrity of aquatic ecosystems. Water quality meets or exceeds State and Federal standards. Water quality (e.g. water temperature, sediment level, dissolved oxygen, and pH) will be improved where necessary to benefit aquatic communities.

DC 11-18: Floodplains properly function as detention/retention storage areas for floodwaters, sources of organic matter to the water column, and habitat for aquatic and riparian species. Modification of the floodplain is infrequent but may be undertaken to protect human life and property or to meet other appropriate management goals (e.g. restoration). There may be evidence of some roads, trails, and recreation developments. Some wetland habitats may show signs of restoration.

DC 11-19: The biological integrity of aquatic communities is maintained, restored, or enhanced. Aquatic species distributions are maintained or are expanded into previously occupied habitat. The amount, distribution, and characteristics of aquatic habitats for all life stages are present to maintain populations of indigenous and desired non-native species. Habitat conditions contribute to the recovery of species under the Endangered Species Act. Species composition, distribution, and relative abundance of organisms in managed habitats are comparable to reference streams of the same region. Some streams and lakes, however, may be stocked with non-native fish by the respective State natural resource agency.

DC 11-20: Beavers are recognized as a keystone species that increase landscape heterogeneity and species diversity. Beaver ponds beneficially modify water flow rates, enhance groundwater recharge rates, raise water tables, sequester sediment, increase aquatic productivity, and modify water chemistry. Over time, beavers create a mosaic of habitats that are utilized by plants, amphibians, fish, insects, birds, and mammals that would not otherwise occur.

STANDARDS FOR 11 - RIPARIAN CORRIDORS

Standards refer to the entire riparian corridor (core and extended area) unless specified otherwise. Refer to Appendix A for slope restriction tables.

General

11-001 Any human-caused disturbances or modifications that may concentrate runoff, erode the soil, or transport sediment to the channel or waterbody are rehabilitated or mitigated to reduce or eliminate impacts. Channel stability of streams is protected during management activities.

11-002 Motorized vehicles are restricted to designated crossings. Access for motorized vehicles may be allowed on a case-by-case basis, after site-specific analysis, outside of designated crossings where it can be shown to benefit riparian resources.

11-003 Management activities expose no more than 10 percent mineral soil within the project area riparian corridor.

Aquatic Habitats within Streams and Rivers

11-004 The removal of large woody debris (pieces greater than 4 feet long and 4 inches in diameter on the small end) is allowed if it otherwise poses a risk to water quality, degrades habitat for aquatic or riparian wildlife species, impedes water recreation (e.g. rafting) or poses a threat to private property or Forest Service infrastructure (e.g. bridges). The need for removal must be determined on a case-by-case basis.

11-005 The addition of large woody debris for stream habitat diversity will generally favor stream reaches with an average bank full width of less than 30 feet in Rosgen B channel types. Log length will generally be 50% greater than bank full width. In stream reaches where there may be potential debris impacts to downstream private or public infrastructure (e.g. bridges) or to water-based recreation (e.g. rafting), the active recruitment (placement) of large woody debris will be limited in quantity and scope.

11-006 Stocking of new non-native species and stocking of previously unstocked areas is not allowed where it will negatively impact native aquatic species or communities. Prior to any stocking, national forests coordinate with the appropriate State and Federal agencies to ensure that populations and habitats of native species are maintained.

11-007 Restoration of chemical integrity of aquatic ecosystems (from impacts such as acid deposition and acid mine drainage) is allowed on a site-specific basis for protection or for restoration of aquatic species.

11-008 Instances where the flow regime is modified for other purposes (such as reservoir releases for recreational sports or hydroelectric demand), evaluate instream flow needs in accordance with the national strategy for water rights and instream flows.

11-009 In-stream habitat improvements, and stream-connected disturbances will be designed and implemented after consideration of the life-cycle requirements of at risk species or species of management concern.

11-010 In cold water stream habitats, activities that unfavorably affect trout spawning should be avoided from October 1 to April 1 in brook trout and brown trout streams and/or March 15 to May 15 in rainbow trout streams. Any necessary in-stream disturbance activities within these time limits must have consultation with state and Forest biologists.

11-011 When working in any waterbody, especially those known to have aquatic nuisance species, remove any visible mud, plants, fish or animals before transporting equipment, eliminate water

from equipment before transporting, clean and dry anything that came in contact with water (boats, trailers, equipment, clothing, dogs, etc.), and never release plants, fish or animals into a body of water unless they came out of that body of water.

11-012 When working in a stream with *Didymosphenia geminta*, soak and scrub all gear for at least one minute in a 2% solution of household bleach, or if cleaning is not practical, dry equipment in the sun for at least 48 hours before using it in another stream. Fish, plants, rocks, and vegetation should not be moved between waterways.

Terrestrial Species

11-013 Existing permanent wildlife openings may be maintained within the riparian corridor. However, permanent wildlife openings identified as causing environmental degradation through concentrated runoff, soil erosion, sediment transport to the channel or water body are mitigated or closed and restored. New permanent wildlife openings within the riparian corridor are permitted where needed to provide habitat for riparian species, or threatened, endangered, sensitive, and locally rare species.

11-014 Use no-till mechanical cultivation methods for maintenance of wildlife openings.

11-015 Small patches of early successional forest may be created within the riparian corridor to provide shrubby areas with low gradient and moist soils to provide habitat for woodcock and meet a habitat need for ruffed grouse and other high priority species. This can be done through cut and leave, girdling trees to create snags, or thinning through timber harvest leaving at least 30 square feet basal area per acre; as determined by site-specific analysis. Trees within 30 feet of the waterbody must be left to maintain bank and floodplain stability.

Rare Communities

11-016 Management actions that may negatively alter the hydrologic conditions of wetland rare communities are prohibited. Such actions may include livestock grazing and construction of roads, plowed or bladed firelines, and impoundments in or near these communities. Exceptions may be made for actions designed to control undesirable impacts caused by beavers, or where needed to control fires to provide for public and employee safety and to protect adjacent private land resources. Beaver impoundments may be removed if they are negatively affecting federally listed species.

11-017 Introducing fish into wetland rare communities is prohibited.

Vegetation and Forest Health

11-018 Insect and disease control measures will be determined on the basis of risk to adjacent resources, long-term sustainability, and appropriate needs for the function and condition of the riparian area. When cutting is an appropriate control tactic, cut and leave is the preferred method for control and suppression of insects and disease in the core of the riparian corridor. Cut and remove is permitted in the extended area beyond the core. Other control measures may be used when a condition poses a risk to stream stability, degrades water quality, adversely affects habitat for aquatic or riparian species, poses a threat to public safety or facilities, or when cut and leave is not effective.

11-019 Tree removals from the core of the riparian corridor may only take place if needed to:

- Enhance the recovery of the diversity and complexity of vegetation native to the site;
- Rehabilitate both natural and human-caused disturbances;
- Provide habitat improvements for aquatic or riparian species, or threatened, endangered, sensitive, and locally rare species;
- Reduce fuel buildup;

- Provide for public safety;
- For approved facility construction/renovation; or
- As allowed in standards 11-015 and 11-024.

11-020 Tree removals from the extended area beyond the core of the riparian corridor may take place to meet the objectives of the adjacent management prescription.

Timber Management

11-021 Lands in the core of the riparian corridor are classified as not suitable for timber production. Vegetation management may be accomplished with commercial timber sales when that is the most practical or economically efficient method.

11-022 Lands in the extended area beyond the core of the riparian corridor may be suitable for timber production when the adjacent management prescription is also suitable.

11-023 When timber harvest occurs in the extended area beyond the core of the riparian corridor for purposes of meeting the objectives of the adjacent management prescription, then vehicles will be excluded from the extended area.

11-024 Corridors for cable logging in areas adjacent to the riparian corridor may cross the riparian corridor. Crossing will be at as near a right angle as possible, with full suspension preferred.

11-025 In cable logging, when full suspension is not possible, partial suspension is allowed with armoring when yarding logs across perennial and intermittent streams.

Non-timber Forest Products

11-026 Do not permit commercial collection of botanical products in the riparian corridor if it would adversely affect the functions and values of the riparian area.

11-027 Permitted firewood cutting within the riparian corridor must take into consideration large woody debris needs. Ranger Districts will identify areas where firewood cutting is not permitted due to large woody debris concerns.

Wildland Fire Management

11-028 Avoid aerial application of retardant or foam within 300 feet of waterways. Fire retardants should not be applied directly over open water.

11-029 Use existing fire barriers; such as streams, roads, trails, etc. for control lines where possible.

11-030 When necessary to construct firelines with heavy equipment (e.g. bulldozers) that cross riparian areas and streams, construct turnouts that will allow runoff to be dispersed and infiltrated into the soil before reaching the stream, and then cross stream at right angle. These firelines should be stabilized and/or revegetated as soon as possible after the fire is controlled.

11-031 Plan prescribed fires to use existing barriers, e.g. streams, lakes, wetlands, roads, and trails, to reduce the need for fireline construction.

11-032 Construction of firelines with heavy mechanized equipment (e.g. bulldozers) in riparian corridors is prohibited. Hand lines, wet lines, or black lines are used to create firelines within the riparian corridor to minimize soil disturbance. Water diversions are used to keep sediment out of streams. Firelines are not constructed in stream channels, but streams may be used as firelines.

Recreation

11-033 New trails will normally be located outside of the riparian corridor except at designated crossings or where the trail location requires some encroachment (e.g. to accommodate stream crossings in steep terrain, etc.), or to manage access to waterbodies.

11-034 New motorized trails are prohibited within the riparian corridor except at designated crossings or where the trail location requires some encroachment; for example, to accommodate steep terrain. When existing off-highway vehicle trails within the riparian corridor are causing unacceptable resource damage, appropriate mitigation measures (which may include OHV trail closure) will be implemented.

11-035 Motorized and non-motorized trail reconstruction and relocation within the riparian corridor are allowed to reduce impacts to riparian and aquatic resources.

11-036 Proposed recreation facilities will be located outside of the riparian corridor or 100-year floodplain (Executive Order 11988) and wetlands (Executive Order 11990) unless no practicable alternative location exists. Where future facilities cannot be located out of the 100-year floodplain, structural mitigation and best management practices will be used. Trails, campsites, and other recreational developments are located, constructed, and maintained to minimize impacts to channel banks and to prevent other resource damage. When existing facilities are causing unacceptable resource damage, appropriate mitigation measures will be implemented. Soils are stabilized on eroding trails and recreational sites.

11-037 Where a riparian area is identified as vulnerable to environmental impacts, camping trailers and vehicles should not be allowed within 50 feet of perennial streams or lakes, except at designated areas.

11-038 Overnight tethering or corralling of horses or other livestock is not allowed within 50 feet of stream courses or lakes. Existing corral sites are maintained to limit impacts to water quality and riparian corridors until alternative sites are developed.

Scenery

11-039 Management activities are designed to meet or exceed a High Scenic Integrity Objective.

Range

11-040 Where grazing is currently allowed and under a permit, grazing is controlled and mitigated to restore, maintain or enhance the integrity of stream channels and banks and prevent unacceptable resource damage. Reauthorizing grazing in riparian corridors within these existing allotments may occur if continued grazing would have no unacceptable resource damage on riparian resources. New grazing allotments or new permits for inactive allotments will exclude the riparian corridor.

11-041 Where authorized by permit, livestock watering areas, stream crossings, and stream banks are managed to maintain bank stability. Designated entry points, crossings, and watering points are located, sized, and maintained to minimize the impact to riparian vegetation and function.

11-042 Feeding troughs and salt and mineral blocks are not allowed inside the riparian corridor unless the entire pasture is within the riparian corridor, in which case they are located as far away from streams as possible. Watering troughs are appropriately located to protect the streams.

Minerals

11-043 The riparian corridors are suitable for federal oil and gas leasing with a controlled surface use stipulation to protect riparian resources and values. Roads, pipelines, and utilities associated with access to lease operations may be allowed to cross riparian areas. Well pads and associated well development infrastructure are not allowed in riparian areas. Other Federal minerals may be available on a case-by-case basis after full consideration of effects on the riparian corridor.

11-044 On existing Federal oil and gas leases, roads, pipelines, and utilities associated with access to lease operations may be allowed to cross riparian areas. Well pads and associated well development infrastructure are not allowed in riparian areas. Existing lease stipulations are used to protect the riparian corridor.

11-045 These corridors are not available for commercial or personal mineral materials. Administrative and free use of mineral materials is allowed only to restore riparian areas and aquatic habitat, control erosion and sedimentation, and repair flood damage.

11-046 Private mineral rights exist in some riparian corridors across the Forest. Roads, wells, and other necessary infrastructure associated with these rights are allowed. Requests for access to a non-Federal interest in lands pursuant to a reserved or outstanding right are recognized, and reasonable access is granted. Encourage such interests to minimize disturbance of riparian resources and values.

Roads

11-047 New roads are located outside the riparian corridor except at designated crossings or where the road location requires some encroachment; for example to accommodate steep terrain, or are allowed within the corridor if the road will cause more resource damage if it were located outside the corridor. When existing roads within riparian corridor are causing unacceptable resource damage, appropriate mitigation measures will be implemented.

11-048 In-stream use of heavy equipment or other in-stream disturbance activities is limited to the amount of time necessary for completion of the project. Construction of crossings is completed on all streams as soon as possible after work has started on the crossing. Permanent and temporary roads on either side of stream crossings within the riparian corridor are graveled.

11-049 When constructing roads, each road segment will be stabilized prior to starting another segment. Stream crossings will be stabilized before road construction proceeds beyond the crossing.

11-050 To minimize the length of streamside disturbance, ensure that approach sections are aligned with the stream channel at as near a right angle as possible. Locate riparian corridor crossings to minimize the amount of fill material needed and minimize channel impacts. Generally, permanent structures or temporary bridges on permanent abutments are provided when developing new crossings on perennial streams. Permanent structures, temporary bridges or hardened fords are used when crossing intermittent streams.

11-051 Design structures (culverts, bridges, etc.) to accommodate storm flows expected to occur while the structures will be in place. Use scientifically accepted methods for calculating expected storm flows.

11-052 Design crossings so stream flow does not pond above the structure during normal flows in order to reduce sediment deposition immediately above the crossing and maintain the channel's ability to safely pass high flows.

11-053 Design the crossing so that stream flow will not be diverted along the road if the structure fails, plugs with debris, or is over-topped.

11-054 If culverts are removed, stream banks and channels must be restored to a natural size and shape. All disturbed soil must be stabilized.

11-055 Fords associated with new road construction are not used in perennial streams without site-specific environmental analysis. Establish fords only under conditions that will not cause significant streambank erosion. Erosion stone or larger rock is used to increase load bearing strength at the water/land interface.

11-056 All new stream crossings will be constructed to allow the passage of aquatic organisms, and maintain natural flow regime. Exceptions may be allowed in order to prevent the upstream migration of undesired species.

Lands and Special Uses

11-057 Riparian corridors are generally unsuitable for new human-created stream channel impoundments, but may be considered on a project specific basis, consistent with appropriate Federal and state regulations. Impoundments will generally be designed to allow complete draining, with minimum flows, cold-water releases, and re-aeration in trout waters and other specific waters when needed. Downstream catch basins and fish ladders are constructed for fish salvage/passage, if necessary. New human-constructed impoundments are unsuitable on streams where federally listed species will be negatively affected.

Other Ground Disturbing Activities

11-058 For activities not already covered in the above standards, ground disturbing activities are allowed within the corridor if the activity will cause more resource damage if it were located outside the corridor, on a case-by-case basis following site-specific analysis. Any activity allowed under these conditions is minimized and effective sediment trapping structures such as silt fences, brush barriers, straw bale barriers, gravelling, etc., are required. Sediment control, prior to, or simultaneous with, the ground disturbing activities, is provided.

12D - REMOTE BACKCOUNTRY AREAS

These are the remote areas of the Forest outside of Wilderness. Included are the following areas: Adams Peak, Archer Knob, Beech Lick Knob, Beards Mountain, Benson Run, Big Schloss, Crawford Knob, Church Mountain, Dolly Anne, Duncan Knob, Elliott Knob, Great North Mountain, High Knob, Jerkemtight, Laurel Fork, Lick Run, Little Alleghany, Little Mare Mountain, Mill Mountain, North Mountain (Lee), Northern Massanutten, Oliver Mountain, Paddy Mountain (Lee), Rough Mountain, Rich Patch, Shenandoah Mountain (WV), Shaws Ridge, Southern Massanutten, The Friar, Three Ridges, Three Sisters, Vesuvius, Warm Springs Mountain, and West Blue Ridge (Whites Peak). There are approximately 201,000 acres allocated to this management prescription area. Where the boundary of one of these areas is coincident with a road, the boundary will be managed as a line 300 feet offset from state roads and 100 feet offset from Forest Roads so as to allow for road maintenance activities.

EMPHASIS

Remote Backcountry Areas are managed to provide mature successional forest with developing or well-developed canopies, large woody material on the ground and den and cavity trees. Recreation opportunities are provided in these large remote, core areas where users can obtain a degree of solitude and the environment can be maintained in a near-natural state. There is little evidence of humans or human activities other than recreation use and nonmotorized trails. These areas are generally 2500 acres or greater in size, unless the area is adjacent to Wilderness.

DESIRED CONDITIONS FOR 12D - REMOTE BACKCOUNTRY AREAS

DC 12-01: These areas provide large tracts of backcountry recreation opportunities with a semi-primitive emphasis that allow limited motorized access. Visitors will be able to choose from a variety of predominately non-motorized recreation opportunities such as hiking, backpacking, mountain bike riding, horseback riding, rock climbing, nature study, hunting, and fishing. Limited motorized activities are also available including dispersed camping and pleasure driving. New motorized uses are not provided. Closed roads are available for both non-motorized uses as well as administrative access.

DC 12-02: These areas are managed and monitored to absorb low to moderate levels of recreation use while protecting air, soil, vegetation, and water resource conditions. Limitations of use will occur if the dispersed activity results in, or is expected to result in, negative affects to the local ecosystem. Human activities may be evident in some places. Visitors will occasionally see other people, especially near the few open roads in these areas. Outdoor skills will be important for visitors in the more remote portions of these areas.

DC 12-03: The landscapes of these areas are primarily shaped by natural processes (floods, storms, insects, diseases, and fires). Landscapes feature a structurally diverse mid- to late successional forest community with a forested canopy, with occasional pastoral and historic/cultural enclaves. The valued character of the natural appearing and cultural landscapes either appears intact or is actually intact. There are no noticeable deviations.

DC 12-04: Prescribed fire plays an important role in the maintenance of forested communities found throughout this management prescription area. Prescribed fire is used to restore and maintain threatened and endangered species habitats, to ensure the continued presence of fire-dependent southern yellow pine and oak woodland ecosystems, to maintain fire-adapted forested communities, and to reduce fuel buildups. Naturally ignited wildfires are used for achieving ecological objectives when possible.

DC 12-05: Aside from these occasional management activities, natural processes will eventually result in a large patch old growth forest matrix throughout most of this area interspersed with naturally occurring brushy and herbaceous openings. Cavity trees, cull trees, standing dead trees, and down logs will be common throughout the area as a result of natural mortality. Occasional large openings of early successional habitat may be created through natural disturbance.

DC 12-06: Wildlife openings and old field habitats are maintained in a grass/forb or shrub/scrub condition. Wildlife species associated with area-sensitive mid- to late successional deciduous forest habitats are expected to inhabit this area. The protection of rare communities and species associates will be provided, along with protection measures for population occurrences for threatened, endangered, sensitive, and locally rare species.

STANDARDS FOR 12D - REMOTE BACKCOUNTRY AREAS

Terrestrial and Aquatic Species

12D-001 Existing old fields, pastoral areas, wildlife openings, and other wildlife habitat improvements may be present and maintained. Expansion of existing openings and/or creation of new openings may occur if permitted under standard 12D-006 (1). Non-invasive non-natives are sometimes used when establishing food plants for wildlife, but native species are preferred. Some openings provide permanent shrub/sapling habitats as a result of longer maintenance cycles.

Vegetation and Forest Health

12D-002 Allow control of insect and disease outbreaks when necessary to protect scenic and recreational values, to reduce hazards to visitors, or for safety and legal reasons. 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.

12D-003 Suppression and eradication of non-native pests are allowed.

12D-004 Tree cutting may occur incidental to other management activities such as trail construction, maintenance, removal of hazard trees, fireline construction, benefit rare communities, etc. Mechanical equipment such as chainsaws is permitted.

Timber Management

12D-005 These lands are unsuitable for timber production. Timber harvest is generally not allowed, subject to valid existing rights.

12D-006 Timber may be cut, sold, or removed if one of the following circumstances exists. The cutting, sale, or removal of timber in these areas is expected to be infrequent.

(1) 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 remote area characteristics;
  (i) To improve threatened, endangered, proposed, or sensitive species habitat; or
  (ii) To maintain or restore the characteristics of ecosystem composition and structure, such as to reduce the risk of uncharacteristic wildfire effects, within the range of variability that would be expected to occur under natural disturbance regimes of the current climatic period;

(2) The cutting, sale, or removal of timber is incidental to the implementation of a management activity not otherwise prohibited; or

(3) The cutting, sale, or removal of timber is needed and appropriate for personal or administrative use.

Non-timber Forest Products

12D-007 Personal use firewood cutting is permitted within 100 feet of roads.

Wildland Fire Management

12D-008 Prescribed fire and wildfires are allowed to reduce wildland fire potential due to high fuel loadings, improve and maintain wildlife habitat, or to benefit fire-dependent and associated species such as table mountain pine and oak forests. Use natural fuel breaks such as streams, roads, rock slides, etc. where possible to minimize fireline construction.

Recreation

12D-009 These backcountry recreation areas are managed for the Semi-Primitive Non-Motorized (SPNM) or Semi-Primitive Motorized (SPM) Recreation Opportunities although inventoried ROS classes range from Semi-Primitive Non-Motorized (SPNM) to Roaded Natural (RN). See ROS Map.

12D-010 New non-motorized trails are allowed on case-by-case basis when there is a demonstrated need, interest, a partnership with user group committed to maintenance, and air, soil, vegetation and water resources are protected.

12D-011 Existing motorized roads and trails are monitored for impacts to soil and water quality and problems mitigated. Roads and motorized trails identified as problems are reconstructed, relocated, or decommissioned.

12D-012 Seasonal closures are used when needed to protect soil, water, and wildlife habitat security.

Scenery

12D-013 Management activities are designed to meet or exceed a High Scenic Integrity Objective.

Range

12D-014 Livestock grazing is not permitted.

Minerals

12D-015 These areas are suitable for federal oil and gas leasing with a no surface occupancy stipulation. Other Federal minerals may be available on a case-by-case basis after full consideration of effects on semi-primitive recreation opportunities and values. The Laurel Fork area is not suitable for federal oil and gas leasing.

12D-016 These areas are not available for mineral materials for commercial or personal purposes. Administrative or free use of mineral materials is allowed when: a) the materials are used within the backcountry area itself; and b) use is necessary to protect the resources and values of the area.

12D-017 Private mineral rights exist in some areas. Roads, wells, and other necessary infrastructure associated with these rights are allowed. Requests for access to a non-Federal interest in lands pursuant to a reserved or outstanding right are recognized, and reasonable access is granted.

Roads

12D-018 Roads may not be constructed or reconstructed unless:

(1) 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 or property;
(2) A road is needed to conduct a response action under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) or to conduct a natural resource

restoration action under CERCLA, Section 311 of the Clean Water Act, or the Oil Pollution Act;

(3) A road is needed pursuant to reserved or outstanding rights, or as provided for by statute or treaty;

(4) 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 or private access, natural resource management, or public health and safety;

(5) 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;

(6) 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

(7) 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 and resource management plan direction, regulations, and laws. 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.

12D-019 Maintenance of system roads is permissible. Along roads that form the boundary of these areas, minor road relocation and vegetation management for road maintenance is allowed within 100 feet of the road.

Lands and Special Uses

12D-020 These areas are unsuitable for wind energy development.

13 – MOSAICS OF HABITAT

EMPHASIS

The Forestwide vision describes the desired condition for ecological systems diversity. This diversity will be achieved through many different practices across the Forest in many of the management prescription areas. Creating and maintaining the diverse ecosystems requires active management activities in some cases. Prescribed fire can be used in many areas of the Forest, but it is a strong emphasis in this prescription area. This prescription area is also the predominant area where timber harvest will be used to create and maintain the ecosystem diversity objectives and where wildlife habitat management activities will be focused for both ecological objectives and recreational (hunting and wildlife viewing) objectives. Another primary objective will be meeting the demand for timber products through timber harvest, salvage of dead and dying trees, and personal use for firewood. There are approximately 508,000 acres allocated to this management prescription area.

The mix of forest communities desired varies by the landtype associations in which this prescription is allocated; however, the canopy generally consists of a mixed hardwood forest composed primarily of oaks and hickories in the uplands. The overstory is often relatively closed, multi-layered, and moderately to densely stocked. The midstory is also multi-layered composed of a diversity of shrubs, vines, grape arbors, and saplings. On drier sites a more open woodland character is present with a more diverse understory of shrubs, grasses and forbs. Southern yellow pines increase as sites become drier on south-facing slopes and towards the ridge tops. On drier, xeric pine/hardwood sites, a simpler midstory structure exists. Poplar, birch, and hemlock increase as moisture availability increases downslope to the coves. These cove forests, composed of mixed mesophytic and dry-to mesic oak communities, are structurally diverse with canopy gaps and small openings.

DESIRED CONDITIONS FOR 13 - MOSAICS OF HABITAT

DC 13-01: The landscape character of this area generally retains a natural, forested appearance. The landscape features structurally diverse forest communities, ranging from rich cove and mesic hardwood/pine forests, with predominantly closed canopies, to xeric pine/hardwood open woodlands, with a mosaic of grass/forb/shrub understories. A mid- to late-successional forest greater than 40 years of age dominates the landscape, but is interspersed with forest communities greater than 100 years of age and temporary and permanent grasslands and shrublands, providing diversity for both wildlife habitat and scenic attractiveness.

DC 13-02: In cove and mesic hardwood/pine forests, with predominantly closed canopies, species needing large areas of mature trees with some level of overstory structural diversity (canopy gaps) are present. In mature mesic and xeric pine/hardwood open woodlands, with a mosaic of grass/forb/shrub understories, species needing large areas of both mature trees and an open structure are present. In addition, xeric pine/hardwood open woodlands provide habitat for post-breeding and migratory stop-over needs for birds species normally associated with forest interior habitat for breeding. A dispersed system of temporary and permanent forest openings and old fields exist, providing herbaceous and shrubby ground cover and abundant insect populations for breeding, post-breeding, and migrating species, such as birds and bats.

DC 13-03: Openings for early successional habitats include: meadows/old fields, shrub/scrub-brushy fields, beaver meadows, recreational openings, orchard openings, wildlife viewing areas, mine reclamation sites, special use areas, utility corridors, gas and oil well sites, stream/riparian zones, wetlands (bogs, fens, marshes, swamps), balds, rock outcrops and talus. Permanent to semi-permanent herbaceous openings are present on up to five percent of the lands and include maintained wildlife openings, linear wildlife openings (seeded log roads), log landings, woodland savannahs and grassland savannahs that will be maintained by annual mowing, rotational mowing or by prescribed fire.

DC 13-04: The following table describes the desired conditions for the major forested ecological system groups in MA Rx 13. The desired conditions for early successional habitat are higher than those identified in the forestwide desired conditions, because this is the main management prescription area where timber harvest

will be used as a tool to create early successional habitat. For the same reason, the desired condition for open areas in this management prescription area is 5%.

Table 4-12. Desired Conditions for Management Prescription Area 13

Ecological System Group	% of Area in 0-10 Age Class	% of Area in Mid - Late Open Canopy Condition
Cove Forests	4-6	6-12
Northern Hardwood Forest	5-7	8-12
Oak Forests and Woodlands	9-11	60-70
Pine Forests and Woodlands	9-11	70-80

DC 13-05: Early successional habitat in the 2100 to 4000–foot elevation range for species like the golden-winged warbler, is abundant in the form of open woodlands, regenerating forests, old fields, balds, and utility rights-of-way. Many patches of these habitats are over 20 acres in size and, where compatible with other multiple-use objectives, are clustered on the landscape to provide optimum habitat for area-sensitive or area dependent species.

DC 13-06: Fire-adapted and fire-dependent ecosystems are plentiful. Open woodland conditions are common and this habitat in enhanced from the integrated use of timber harvest and prescribed burning, independently or concurrently on the same acres in an integrated fashion.

DC 13-07: Portions of this prescription area are managed by natural processes and prescribed fire and contribute to the older aged forest component across the prescription area. These lands include riparian areas, areas of low productivity, and lands where commercial timber harvest is uneconomical. The resulting landscape structure of this land allocation provides a forest matrix appropriate for linking large and medium-sized late successional to old growth patches. Trees greater than 120 years of age occur commonly as individuals, groups, or large areas. Cavity trees, cull trees, standing dead trees, and down logs are common throughout the area as a result of natural mortality.

DC 13-08: Rockfalls, caves, road culverts, uprooted trees, and trees larger than 22 inches in diameter serve as potential dens. Known den trees are retained in harvest areas and future den trees will be recruited over the long term on the many acres in older age classes.

DC 13-09: Water sources for wildlife, including ephemeral ponds for herpetofauna, are present.

DC 13-10: Prescribed fire plays an important role in the maintenance of many of the forested communities found throughout this management prescription. Prescribed fire is frequently used to encourage oak sprouting and reduce competition from more shade tolerant species, to restore and maintain threatened and endangered species habitats, and to ensure the continued presence of fire-dependent southern yellow pine ecosystems. Prescribed fire and commercial timber harvest are employed to maintain the hard mast producing capabilities of the forest communities containing oaks and hickories.

DC 13-11: ~~A~~ diversity of tree species of mast bearing age in dominant and co-dominant crown classes is common. Trees with open-grown crowns receiving plenty of sunlight produce the most acorns and the creation of openings two acres in size and greater to get full sunlight on the forest floor helps maintain oak regeneration as well as stimulate soft mast and browse production. A diversity of forest age classes is also important in these areas to provide soft mast and herbaceous vegetation.

DC 13-12: Forest product commodity outputs contribute to the social and economic wellbeing of the people living in the area and help maintain a way of life long associated with those living within the area. Timber harvesting is apparent and uses sale layout and design to accommodate visual considerations through innovative harvesting techniques and sale layout. Timber growth on suitable land is emphasized at a higher

level than other management prescription areas but well within the biological capabilities for sustained yield production.

DC 13-13: Roads provide access for management activities and access for various recreational experiences such as hunting and wildlife viewing. Roadsides can also provide additional open canopy habitat. However, roads also may disturb some wildlife species, particularly during breeding, nesting and brooding times and much of the area will be managed with seasonal road closures to protect physical and biological resources and wildlife habitat.

DC 13-14: A range of recreational settings from roaded frontcountry to more remote areas are found in this area. Access is provided through portions of the area on Forest Service and State roads with a gravel or native surface. Challenging opportunities may exist for high-clearance and 4-wheel drive vehicles on open roads.

DC 13-15: Forest visitors on foot, horse, or bikes may experience some solitude in portions of this prescription area where roads are managed as closed. Levels of personal challenge are moderate to low. Comfort, sanitation, and camping facilities are not provided, although primitive camping can be enjoyed throughout the area. During most of the year, occasional encounters with other forest visitors can be expected; however, these encounters are more frequent during spring and fall hunting seasons. This area provides excellent opportunities for wildlife viewing and photography, hunting, hiking, equestrian use, mountain biking and dispersed camping.

DC 13-16: Meeting the Scenic Integrity Objectives within this prescription allows for human activities that mimic the natural disturbances consistent with each ecological system.

Standards for 13 - Mosaics of Habitat

Terrestrial and Aquatic Species

13-001 Existing old fields, pastoral areas, wildlife openings, and other wildlife habitat improvements may be present and maintained. Expansion of existing openings and/or creation of new openings may occur. Non-invasive non-natives are sometimes used when establishing food plants for wildlife, but native species are preferred. Some openings provide permanent shrub/sapling habitats as a result of longer maintenance cycles.

Vegetation and Forest Health

13-002 Manage for a diversity of oak species to minimize yearly fluctuations in acorn supplies.

13-003 The forest health strategy is to minimize the occurrence of pest problems by managing host-type conditions. Suppression of pests, both non-native and native, is accomplished with all available integrated pest management tools.

13-004 Proactively manage species composition and tree vigor in stands at a level that reduces susceptibility to damage from insect and disease infestations and other forest health problems like oak decline. Suppress native and non-native insects and diseases using an integrated pest management approach.

Timber Management

13-005 Timber production is a suitable use in these areas. Some portions of the areas are identified as unsuitable for timber production due to the timber suitability analyses in Appendix C.

13-006 Use even and uneven-aged silvicultural systems. Uneven-aged forest management (e.g. group selection, individual tree selection) practices are designed to result in forest structure and composition consistent with late-successional deciduous forest habitats over the long-term.

13-007 New non-motorized trails are allowed on a case-by-case basis when there is a demonstrated need, interest, a partnership with one or more user groups committed to maintenance, and air, soil, vegetation and water resources are protected.

13-008 Within potential wilderness areas, new recreation facilities are restricted to the minimum needed for the protection of resources.

13-009 Interpretive facilities and services including signs, viewing areas and self-guided programs may be provided to enhance visitor appreciation and understanding of the diversity of ecological systems with an emphasis on open woodlands and fire-adapted and fire-dependent communities.

13-010 Thinning and group selection may be employed to increase the structural diversity of the prescription area.

13-011 Thinning is frequently used to increase volume production and tree vigor and manage species composition. Uneven-aged management, using group selection, may be employed to reduce impacts to scenery.

13-012 Regeneration harvest areas range in size from 2 to 40 acres.

13-013 Regeneration harvest areas are primarily coppice with reserves with 15-25 square feet of basal area per acre left to ensure adequate sunlight for oak regeneration and two-aged silvicultural systems which leave 20-40 square feet of basal area per acre. In order to provide vertical diversity and future mast production, the residual stand should be primarily composed of former co-dominant trees.

13-014 Clearcut harvest systems may occur when necessary to achieve specific wildlife habitat objectives. Thinning and group selection silvicultural systems are also employed to provide the structural diversity required by some species within this habitat association.

13-015 Regenerate pine forest types artificially or naturally to native pine species that commonly occur within the same land type association. Regenerate pine-hardwood forest types artificially or naturally to mixed pine-hardwood stands of native species that commonly occur within the same land type association.

13-016 Salvage of dead and dying trees is allowed.

Non-timber Forest Products

13-017 Commercial and personal use firewood collection is allowed.

Wildland Fire Management

13-018 Prescribed fire and wildfire may be used to: create open woodland habitat conditions; create openings that stimulate soft mast production and browse; encourage oak sprouting; maintain, restore, and enhance native forest communities; ensure the continued presence of fire-dependent ecosystems; improve threatened, endangered, sensitive, and locally rare species habitat; and reduce fuel buildups. It is also used in conjunction with site preparation to accomplish silvicultural treatments.

Recreation

13-019 Wildlife openings, including linear strips, are signed to protect established vegetation from recreational use (e.g. horseback riding, mountain biking, off-highway vehicle use, and camping) when a reoccurring problem of resource damage exists.

Scenery

13-020 Management activities are designed to meet or exceed the following Scenic Integrity Objectives:

Inventoried Scenic Class	1	2	3	4	5	6	7
Scenic Integrity Objectives	H	M	M	M	M	L	L

H=High; M=Moderate; L=Low

13-021 Clustering of early successional habitats occurs primarily within scenic classes 3 through 7.

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CHAPTER 5 – IMPLEMENTATION AND MONITORING

INTRODUCTION

Chapter 5 provides information to guide putting the Forest Plan into practice, or implemented. Two of the most important aspects of implementing the Forest Plan are monitoring and evaluation. Monitoring and evaluation provide information to determine whether programs and projects are meeting Forest Plan direction, and whether the Plan should be amended or revised. This Chapter establishes Monitoring Questions that are to be answered over the course of Forest Plan implementation.

The last section of this Chapter discusses how this Forest Plan may be amended or revised as a result of this monitoring and evaluation.

IMPLEMENTATION

The approval of this Forest Plan establishes direction so that all future decisions in the planning area will include an "interdisciplinary approach to achieve integrated consideration of physical, biological, economic and other sciences" (16 USC 1604(b)). The Forest Plan will be implemented through a series of project-level decisions based on appropriate site-specific environmental analysis and disclosure to assure compliance with the National Environmental Policy Act (NEPA). The NEPA analysis process begins once these individual projects have been identified. Project-level environmental analyses will tier to the Final Environmental Impact Statement (FEIS). The FEIS for the Forest Plan is an aid to project-level NEPA compliance.

Common project-level decisions include whether or not, and if so, in what way, timber will be harvested in a given area, a campground will be constructed, or a fisheries structure will be installed. The form of documentation for such analysis will be consistent with the Council of Environmental Quality NEPA Regulations [40 CFR 1500-1508], and Forest Service Manual and Handbook procedures.

The Forest Plan does not contain a commitment to the selection of any specific project. Instead, it determines what types of projects are permissible and under what conditions on different portions of the Forest. For instance, the Forest Plan may determine that portions of specific management areas are suitable for timber production. It does not make decisions on the specifics of any particular timber sale that could occur on lands suitable for timber production. Such decisions must be based on appropriate site-specific analysis and appropriate disclosure during project-level analysis.

Accomplishment of the annual program of work on the Forest is the incremental implementation of management direction in the Forest Plan. The projects chosen to implement this Forest Plan should be those which lead to achieving objectives, moving towards desired conditions. Depending on final budgets or other factors such as weather, outputs and activities in individual years may be significantly different from planned objectives.

As described in the Monitoring and Evaluation section of this Chapter, the Interdisciplinary Team will evaluate how the selection of projects is achieving the goals, objectives, and desired conditions of the Forest Plan.

MONITORING AND EVALUATION

Monitoring and evaluation provide information to determine whether programs and projects are meeting Forest Plan direction, and whether the cost anticipated to implement the Forest Plan coincides with actual costs. Monitoring and evaluation is required by National Forest Management Act (NFMA) implementing regulations (36 CFR 219.12(k)) to determine whether requirements of the regulations and Forest Plan are being met. Monitoring and evaluation are components of adaptive management. As resource conditions change, on-going monitoring and evaluation help identify the need to adjust desired conditions, objectives, and standards. This process helps determine how the Plan is being implemented, whether or not plan implementation is achieving

desired outcomes, and whether or not assumptions made in the planning process are valid. Monitoring and evaluation allows the incorporation of new understanding and technology; changes in law, policy, and resource conditions; and growing concerns, trends, and changing social values into land management planning.

The concept of adaptive management is foundational for planning and Forest Plan implementation in a dynamic environment. Regulations require that Forest Plans be revised periodically (36 CFR 219.10(g)). However, Forest Plans may need to be more dynamic to account for changed resource conditions (such as large storms or insect outbreaks), new information or findings of science, or new regulations or policies. An effective monitoring and evaluation program is essential for determining when these needs may exist and for leading to quick resolution of a need for change.

The Monitoring and Evaluation Framework was developed to address three types of monitoring:

- Implementation monitoring: addresses whether the Plan direction is being carried out.
- Effectiveness monitoring: determines whether or not implementing the direction and desired conditions in the Plan is achieving the goals and objectives.
- Validation monitoring: determines whether or not assumptions and models used in the Plan are appropriate.

Monitoring and evaluation are distinct activities. The monitoring phase generally includes the collection of data and information, either by observation, direct measurement or compiling data from appropriate sources. Evaluation is the analysis of this data and information, and is used to assess if the Forest Plan is being implemented correctly and whether it needs to be changed. Forest Plan Monitoring and Evaluations will be reported regularly in the Forest Monitoring and Evaluation Report.

Monitoring and evaluation may lead to adjustments of programs, projects or activities, changes or amendment to the Forest Plan itself or used to recommend changes in laws, regulations, and policies that affect both the Forest Plan and project implementation (FSM 1922.7).

Forest Plan amendments and revisions should be responsive to changes that affect the Forest Plan, and may be needed at any time if a Forest Plan becomes out of date in some way. Within an adaptive management framework, the need to amend or revise the Forest Plan may result from:

- Recommendations of an interdisciplinary team, based on evaluation and monitoring results;
- Changes in agency policy and regulations;
- Planning errors found during Forest Plan implementation;
- Changes in physical, biological, social, or economic conditions.

This Chapter establishes a Monitoring and Evaluation (M&E) Framework containing the questions to be answered over the course of Forest Plan implementation. This framework was developed from the Forest Service national model identified in the publication entitled *LMP Monitoring and Evaluation: a Monitoring Framework to Support Land Management Planning* (USFS 2007). The national framework model enables a consistent NFS approach in monitoring progress of land management toward achieving desired social, economic, and ecological conditions. It was also designed to be a framework for application agency-wide as the foundation of a multi-scale National Forest System (NFS) monitoring and evaluation program to meet regional and national reporting needs.

The six themes of the M&E framework summarize key forest management legislation that guides and regulates management on the NFS and reflect interrelated and interdependent social, economic, and ecological elements of sustainability.

- Theme 1 - Conservation of Biological Diversity: This theme addresses the Forest's contributions to securing the nation's heritage of plant and animal species in the plan area. Disturbance processes are included under maintenance of land health and vitality theme (T-2). In addition, abiotic plan components for ecosystem diversity are included under the conservation and maintenance of soil, water, and air resources theme (T-3).

- Theme 2 - Maintenance of Land Health and Vitality: This theme addresses ecological disturbance processes affecting social, economic, and ecological conditions within plan areas.

- Theme 3 - Conservation and Maintenance of Soil, Water, and Air Resources: This theme addresses the ecological condition (for soil, air, and water) of watersheds to protect the physical, chemical and biological integrity; the productive capacity of NFS land; water quality and quantity; and opportunities for beneficial uses. It also addresses the related capacity of watersheds to respond resiliently to flooding and to reach or sustain their aquatic ecosystem potential.

- Theme 4 - Maintenance and Enhancement of Social Systems: This theme addresses the opportunities, settings, suitable uses for multiple-use provided by the NFS, including opportunities for market and non-market activities. Related goods and services derived from the opportunities and settings provided are reflected in the economic theme.

- Theme 5 - Maintenance and Enhancement of Economic Systems: Given the opportunities and settings, suitable uses, and activities designed to make progress towards desired conditions, there are goods and services that come off the land. This theme is about goods and services derived from the opportunities and settings referenced in the social theme (T-4). Key contributions of goods and services include revenue and jobs associated with recreation, tourism, resident amenities, environmental services, and commodities such as AUMs and the potential for timber production.

- Theme 6 - Infrastructure Capacity: This theme addresses NFS infrastructure's ability to contribute to the aspirations characterized in the LMP.

In addition to the six themes, the framework establishes a set of nine social, economic, and ecological sub-element priorities to be considered in respective Forest/Grassland LMP monitoring programs. Common sub-element priorities include: vegetation diversity, species diversity, invasive species, resilience to fire disturbance, insects and disease, watershed health, diversity of opportunities and settings, provision of goods and services, and roads and trails.

The Forest monitoring framework is intended to be scalable so that it can be coordinated and integrated with relevant broader scale monitoring strategies. An example is the breeding bird surveys that provide direct Forest information and are part of broad landscape analyses of bird populations.

The Monitoring and Evaluation Framework is part of the Forest Plan and is stated in terms that will direct *what* will be monitored, but are not so specific as to address *how* monitoring will be accomplished. The Monitoring and Evaluation Framework will be further refined during Forest Plan implementation into Monitoring Elements and Task Sheets, which are more detailed, specific and measurable than the monitoring questions themselves. Monitoring Elements and Task Sheets may be modified and prioritized to guide monitoring activities over the course of Forest Plan implementation. The Monitoring Summary Table (Appendix H) indicates the nature of Monitoring Elements and monitoring details that are to be further developed during Forest Plan implementation. The Monitoring Summary Table is presented here only for information and may be modified as needed to address changes in needs, priorities, availability of personnel and funding.

MONITORING AND EVALUATION FRAMEWORK THEMES AND ELEMENTS

Theme 1	***T1.3 Ecological Diversity***
Theme 1	**Conservation of Biological Diversity:** This theme addresses National Forest System (NFS) contributions to securing the nation's heritage of plant and animal species in the plan area. Disturbance processes are included under the maintenance of Land Health and Vitality Theme (T-2). In addition, abiotic plan components for ecosystem diversity are included under the conservation and maintenance of soil, water, & air resources theme (T-3).
Sub-element NFS Generic Desired Condition	***T1.3 Ecological Diversity:*** *Contributing to securing the nation's heritage of plant species and related habitats for T&E, sensitive and locally rare species in the plan area.* Appropriate ecological conditions are provided throughout the plan area to support populations of native species, contribute to the recovery of T&E species, to avoid federal listing of species, and to achieve resource goals for other species of concern.
Contextual Statement	There are 24 ecological systems identified for the GWNF. These systems have similar potential and opportunities for management. The ecological systems for the GWNF represent both major and rare community types. We identified that many of the ecological systems had similar key attributes, indicators, species associates and resulting forest plan components. For purposes of analysis we combined the systems into the following ESE Tool Systems:

Ecological System Groups	Ecological System
Spruce Forest	Central and Southern Appalachian Spruce-Fir Forest
Northern Hardwood Forest	Appalachian (Hemlock)-Northern Hardwood Forest
	Southern Appalachian Northern Hardwood Forest
Cove Forest	Southern and Central Appalachian Cove Forest
Oak Forests and Woodlands	Northeastern Interior Dry-Mesic Oak Forest
	Central and Southern Appalachian Montane Oak Forest
	Central Appalachian Dry Oak-Pine Forest
	Southern Appalachian Oak Forest
	Southern Ridge and Valley/Cumberland Dry Calcareous Forest
Pine Forests and Woodlands	Southern Appalachian Montane Pine Forest and Woodland
	Central Appalachian Pine-Oak Rocky Woodland
	Southern Appalachian Low-Elevation Pine Forest
Mafic Glade and Barrens and Alkaline Glades and Woodlands	Southern and Central Appalachian Mafic Glade and Barrens
	Central Appalachian Alkaline Glade and Woodland
Cliff, Talus and Shale Barrens	North-Central Appalachian Circumneutral Cliff and Talus
	North-Central Appalachian Acidic Cliff and Talus
	Appalachian Shale Barrens
Floodplains, Wetlands, and Riparian Areas	Central Appalachian Floodplain
	Central Appalachian Riparian
	Central Interior Highlands and Appalachian Sinkhole and Depression Pond
	Southern and Central Appalachian Bog and Fen
	North-Central Appalachian Acidic Swamp
	North-Central Appalachian Seepage Fen
Caves and Karstlands	Caves and Karstlands

Theme 1	*T1.3 Ecological Diversity*
LMP Desired Condition Statement	See Forest Plan Chapter 2 Desired Conditions for Ecological Systems Diversity
Objectives	See Forest Plan Chapter 3 Objectives for Ecological Systems Diversity
Desired Trend Statement	Trends in conditions of all of our ecological systems are moving toward the LMP desired conditions and objectives.
Monitoring Questions	How are ecological conditions maintaining or making progress toward the LMP desired conditions and objectives? What are the current condition and trend of key characteristics for vegetation identified in the desired conditions (DC) for the plan area? How are management actions maintaining or making progress toward DC for the key characteristics of vegetation in the plan area?
LMP Performance Measures	Current level and trend of ecological conditions, as might be shown by: **1.** Abundance, distribution, and trend of aquatic and terrestrial ecosystem conditions (e.g., vegetation types, successional stages, and structure) that provide species habitat **2.** Abundance, distribution and trend of conditions of special biological areas
Data Sources	FACTS, LANDFIRE, State Agencies (WV DNR, VA DGIF, VA DCR-Natural Heritage Program), FIA, NRIS (Fauna, FSVeg, Terra), The Nature Conservancy, NatureServe, Other Partners.
Importance	Managing for the diversity of plant and animal communities is required by NFMA. The specific direction is the following: "Provide for diversity plant and animal communities based on the suitability and capability of the specific land area in order to meet overall multiple-use objectives" (16 USC 1604(g)(3)(B)). Ecosystem diversity is a primary means by which a plan contributes to sustaining ecological systems and conserving biodiversity. (NOTE: Disturbance processes are included under maintenance of land health and vitality theme**.** In addition, abiotic plan components for ecosystem diversity are included under the conservation and maintenance of soil, water, and air resources theme.)
What it Tells Us	This sub-element addresses the composition, structure, abundance, distribution and successional processes of vegetation types in the plan area. Information on these characteristics provides direct evidence of changes in biodiversity and also indexes of the quality, distribution and abundance of habitat to support other elements of biodiversity in the plan area. This information can be used as indicators of change to ecosystems and their associated biota that are difficult to measure directly. (NOTE: This sub-element was narrowed to focus on key characteristics of vegetation of terrestrial ecosystems. Aquatic ecosystems are included under the conservation and maintenance of soil, water, and air resources theme.)

Theme 1	***T1.1 Vegetation Diversity & T1.2 Species Diversity***
Theme 1	***Conservation of Biological Diversity:*** This theme addresses NFS contributions to securing the nation's heritage of plant and animal species in the plan area. Disturbance processes are included under maintenance of land health and vitality theme (T-2). In addition, abiotic plan components for ecosystem diversity are included under the conservation and maintenance of soil, water, & air resources theme (T-3).
Sub-element NFS Generic Desired Condition	***T1.1 Vegetation Diversity:*** *Contributing to securing the nation's heritage of plant species and related habitats for T&E, sensitive, & locally rare in the plan area.* ***T1.2 Species Diversity:*** *Contributing to securing the nation's heritage of animal species and related habitats for T&E, sensitive, & locally rare in the plan area.*
Contextual Statement	Providing for ecosystem diversity meets the needs most of the species on the Forest. However, some species with narrow habitat needs, limited habitat abundance or limited habitat distribution need additional attention. 290 species were identified that needed additional analysis including 10 Federally listed Threatened or Endangered species. The Plan has identified 14 Management Indicator Species (MIS) to indicate the effects of management activities and achievement of desired conditions and objectives.
LMP Desired Condition Statement	See Forest Plan Chapter 2 Desired Conditions for Species Diversity
Objectives	See Forest Plan Chapter 3 Objectives for Species Diversity
Desired Trend Statement	Trends in ecological conditions for T&E species, sensitive species and locally rare are moving toward the LMP desired conditions and objectives.
Monitoring Questions	How are ecological conditions for selected T&E species, sensitive, or locally rare maintaining or making progress toward the LMP desired conditions and objectives? How are management actions for the recovery of T&E species, conservation of sensitive, and management of locally rare achieving LMP objectives? How are changes in Management Indicator Species and the relationship to their habitats reflecting the effectiveness of management activities in achieving desired conditions and objectives?
LMP Performance Measures	Current level and trend of ecological conditions for T&E, species, sensitive, or locally rare species, as might be shown by: 1. Abundance, distribution, and trend of habitat needs for identified species groups or identified species. 2. Estimation habitat changes for MIS.
Data Sources	FACTS, LANDFIRE, State Agencies (WV DNR, VA DGIF, VA DCR-Natural Heritage Program), FIA, NRIS (Fauna, FSVeg, Terra), The Nature Conservancy, NatureServe, Other Partners.
Importance	Species diversity part of the framework for sustaining ecological systems. T&E species, sensitive and locally rare species must be identified, and specific plan components may be developed for them as required by NFMA. T&E species and their habitats are also required to be protected and managed for under the Endangered Species Act. Monitoring of MIS and the relationships to habitat changes is required by NFMA.

Theme 1	***T1.1 Vegetation Diversity & T1.2 Species Diversity***
What it Tells Us	Ecological conditions, not provided for in T1.1 (ecosystem diversity) to establish appropriate ecological conditions for specific T&E, sensitive and locally rare species, are co-implemented here by additional needed provisions consistent with agency authorities, the capability of the plan area, and overall multiple use objectives. Information is collected on ecological conditions in order to determine whether LMP desired conditions and objectives for species are being met. Estimations of MIS and changes in their habitat conditions could indicate that current management is adversely affecting the composition, structure, or function of those habitats, resulting in Plan direction and desired conditions not being met and the need for adaptive management.

Theme 2	***T2.1 Invasive Species***
Theme 2	**Maintenance of Land Health and Vitality:** This theme addresses ecological disturbance processes affecting social, economic, and ecological conditions within LMP plan areas.
Sub-element NFS Generic Desired Condition	***T2.1 Invasive Species*** The National Forest/Grassland has reduced the potential for introduction, establishment, and spread of invasive species and has reduced existing infestations in priority areas.
Contextual Statement	Invasive species of highest current concern include gypsy moth, Japanese stiltgrass, autumn olive, garlic mustard, tree-of-heaven, multiflora rose, oriental bittersweet, bush honeysuckle, Japanese knotweed, and spotted knapweed. Existing infestations are presumably expanding because control efforts are limited.
LMP Desired Condition Statement	See Forest Plan Chapter 2 Desired Conditions for Nonnative Invasive Species
Objectives	See Forest Plan Chapter 3 Objectives for Nonnative Invasive Species
Desired Trend Statement	The GWNF has reduced the potential for introduction, establishment, and spread of invasive species and has reduced existing infestations in priority areas.
Monitoring Questions	What are the status and trends of areas infested by aquatic and terrestrial invasive species on the unit's plan area relative to the desired condition? How effective were our management activities including partnerships in preventing or controlling targeted invasive species (some of which may be Species of Interest)?
LMP Performance Measures	Change in extent and rate of spread of the targeted species infestation Change in ecosystem and species diversity in infested areas Percentage of priority (treated) acres successfully restored against targeted invasive species
Data Sources	Data are available from these Forest Service sources: FIA, FACTS, and NRIS.
Importance	Invasive species infestations negatively affect forest health, management objectives, genetic diversity, recreational use, resource production, water quality, and the economy. The threat to land health from invasive species is acute and is expanding. If invasive species are present, natural processes and the survival of native species are at great risk. NFMA requires that we provide for diversity of native species, and invasive species threaten our ability to meet this requirement. Both the national Invasive Species Council and the Forest Service have national strategies and management plans.
What it Tells Us	With the wide range of invasive species (plants, vertebrates, invertebrates, and pathogens) affecting ecosystems and the respective native species and natural processes, monitoring the status of infestations on the National Forest System will help us to evaluate the effectiveness of our management activities, and subsequently the condition of the land, or land health. It will also help us to prioritize areas for restoration.

Theme 2	***T2.2 Resilience to Fire Disturbance.***
Theme 2	**Maintenance of Land Health and Vitality:** This theme addresses ecological disturbance processes affecting social, economic, and ecological conditions within LMP plan areas.
Sub-element NFS Generic Desired Condition	***T2.2 Resilience to Fire Disturbance.*** Fire-adapted ecosystems in the plan area contribute to sustainable environmental, social, and economic benefits, i.e., Fire Regime Condition Class (FRCC) 1.
Contextual Statement	On the GWNF, fire management, both prescribed fire for ecosystem restoration and wildfire, is a major focus to us and to our neighbors and partners. A return to fire-adaptive ecosystems throughout the GWNF is preferred, yet, in areas near residential developments and other high-value sites, rapid suppression and management treatments are likely necessary until successful return to fire-adapted systems occurs on adjacent wildlands.
LMP Desired Condition Statement	See Forest Plan Chapter 2 Desired Conditions for Fire
Objectives	See Forest Plan Chapter 3 Objectives for Fire
Desired Trend Statement	Management activities allow for no net loss of FRCC 1 lands, while restoring FRCC 2 and FRCC 3 areas, where restoration activities have the highest probability of success, are consistent with multiple resource objectives, and are socially and economically feasible.
Monitoring Questions	What is the distribution and trend in Fire Regime Condition Class on the National Forest/Grassland? How effective are management actions in moving the National Forest/Grassland toward FRCC 1?
LMP Performance Measures	Number of acres in each FRCC at a benchmark (*i.e.,* the release of LANDFIRE National data) compared to acres in each FRCC at a five year interval following the benchmark year. Impact of management actions designed to improve FRCC distribution
Data Sources	LANDFIRE, FACTS, and local monitoring
Importance	Fire suppression has caused ecosystem health problems. Much of the GWNF has ecological systems where periodic fire has historically played an important role in preserving structure and composition of the systems.

Theme 2	***T2.2 Resilience to Fire Disturbance.***
What it Tells Us	By focusing on assessing resilience to fire disturbance, we will be able to adjust our management actions to restore lands to a more healthy fire frequency and intensity. We will use Fire Regime Condition Class (FRCC), which is a measure of ecological integrity and/or departure from reference conditions. It tells us if the ecosystem in question is doing well, in concert with inherent disturbance regimes (class 1), in some jeopardy based on the time since the last disturbance (class2), or significantly altered and at risk of losing key ecological components that define that ecosystem as unique (class 3). It is most relevant to measure long-term trends rather than annual changes, and the scale of FRCC is also meaningful for hydrological sub unit analysis. In the LMP, FRCC monitoring can be useful in targeting areas for priority management activities or measuring progress or deterioration of a given area over time.

Theme 2	***T2.3 Native Insects & Pathogens***
Theme 2	**Maintenance of Land Health and Vitality:** This theme addresses ecological disturbance processes affecting social, economic, and ecological conditions within LMP plan areas.
Sub-element NFS Generic Desired Condition	***T2.3 Native Insects & Pathogens.*** National Forest/Grassland ecosystems have the capacity for renewal and recovery from outbreaks caused by native insects and pathogens while meeting desired values, uses, products, and services.
Contextual Statement	The main native insect of concern on the GWNF is the southern pine beetle. It is not often a major problem, but populations can occasionally build up to the point that it causes damage to the native pine stands on the GWNF.
LMP Desired Condition Statement	See Forest Plan Chapter 2 Desired Conditions for Native Invasive Species
Objectives	See Forest Plan Chapter 3 Objectives for Native Invasive Species
Desired Trend Statement	Native insect and pathogen populations are maintained within or moving towards a range that allows the ecosystem to recover from outbreaks while meeting desired values, uses, products and services.
Monitoring Questions	What are the status and trends of outbreaks of native insects and pathogens on the National Forest/Grassland? What are the trends in areas at risk to future outbreaks of native insects and pathogens on the National Forest/Grassland?
LMP Performance Measures	Location and extent of outbreaks of native insects and pathogens. Location and extent of areas at risk to future outbreaks of native insects and pathogens.
Data Sources	Data are available from FHM, FHP, FIA, and NRIS.
Importance	Native insects and pathogens are natural components of ecosystems playing critical roles in development and succession of plant communities, decomposition, and soil formation. Population dynamics of native insects and pathogens are influenced by vegetation condition, climate, other disturbances, management activities, host defenses, and natural enemies. Changes in these factors can lead to outbreaks or epidemics of native insects and pathogens with significant ecological and economic consequences.
What it Tells Us	This sub theme will help us determine the status and trends in outbreaks of native insects and pathogens and relate those to the health and sustainability of the National Forest/Grassland ecosystems. Identifying areas at risk for future outbreaks will facilitate development of prevention strategies.

Theme 3	***T3.1 Watershed Health***
Theme 3	**Conservation and Maintenance of Soil, Water, and Air Resources:** This theme addresses the ecological condition (for soil, air, and water) of watersheds to protect the physical, chemical and biological integrity; the productive capacity of NFS land; water quality and quantity; and opportunities for beneficial uses. It also addresses the related capacity of watersheds to respond resiliently to flooding and to reach or sustain their aquatic ecosystem potential.
Sub-element NFS Generic Desired Condition	***T3.1 Watershed Health*** Ecological function operates in its natural role within watersheds of the plan area while resource management activities sustain human needs and uses.
Contextual Statement	The GWNF has tremendous opportunities that depend upon healthy watersheds, including the abundance of high-quality water that provides drinking water to neighboring communities and habitat for T&E, sensitive and locally rare species. Concern for healthy watersheds is growing because so much depends upon it. A watershed is the area of land that drains water to an outlet at some point along a stream channel. Watershed function is the ability of watersheds to route water, sediment, nutrients, and organic material from hill slopes and groundwater aquifers to the channel network. It also includes the ability of stream channels to transport the sediment being delivered to them. The rates at which these processes occur are a function of climate, geology, landforms, soils, and vegetation. Watershed integrity and stability refer to the ability of watersheds, stream channels, riparian areas, groundwater aquifers, and wetlands to absorb and reduce the impacts from normal floods (i.e., those that occur approximately every 2 to 3 years, on average) and similar disturbances without rapid erosive changes to the system.
LMP Desired Condition Statement	See Forest Plan Chapter 2 Desired Conditions for Watersheds, Soils, and Geologic Resources
Objectives	See Forest Plan Chapter 3 Objectives for Watershed Resources
Desired Trend Statement	Trends in aquatic ecosystems are moving toward the LMP desired conditions and objectives.
Monitoring Questions	What is the ecological condition and trend of watershed health, including the aquatic ecosystem potential, for watersheds identified in the desired condition and/ or objectives of the plan area? How effective are management actions in moving the National Forest/Grassland toward improving watershed health? Are management systems implemented in a manner to assure they do not substantially and permanently impair the productivity of the land?
LMP Performance Measures	Current status and trend for soil productivity, water quality and quantity, air quality, and other ecological parameters to address ecological condition within watersheds so that they are able to attain their aquatic ecosystem potential. Examples o Physical characteristics of stream channel (e.g., amount of large woody debris) o Chemical characteristics of stream channel (e.g., nutrient loading) o Biological characteristics of stream channel (e.g., macro-invertebrate populations) o Riparian area characteristics (e.g., vegetation diversity, invasive species, etc.) o Upland characteristics of watershed (e.g., soil monitoring, vegetative trend and condition)

Theme 3	***T3.1 Watershed Health***
Data Sources	Macroinvertebrate monitoring database, water quality monitoring database
Importance	Watershed health is integral to all aspects of resource management and use. Watershed health is a state in which resource management activities sustain human needs and uses of the watershed while ensuring ecological function is maintained. Maintaining watershed health through watershed management requires land managers to balance human needs and uses with ecological conditions within the watershed. Good watershed management maintains the productive capacity of NFS land; protects water quality and quantity; provides beneficial uses; and reduces the threat of flood. Productive soils and adequate moisture ensure the existence of potential community types and wildlife habitats.
What it Tells Us	The sub-element will measure the status and trend of ecological conditions to reflect results of cumulative effects of watershed management activities on watershed health and the cumulative benefits of good land management. This is not a direct measure of biodiversity. Rather, it addresses ecological conditions that will in turn support biodiversity (aquatic ecosystem potential). Biodiversity itself is addressed in the “conservation of biological resources” theme.

Theme 4	***T4.1 Diversity of Opportunities and Settings***
Theme 4	**Maintenance and Enhancement of Social Systems:** This theme addresses the opportunities, settings, suitable uses for multiple-use provided by the NFS, including opportunities for market and non-market activities. Related goods and services derived from the opportunities and settings provided are reflected in the economic theme (T-5).
Sub-element NFS Generic Desired Condition	***T4.1 Diversity of Opportunities and Settings*** *(including 'Access' & 'Opportunity for Commodity Production')* Settings available on the NFS unit deliver multiple social opportunities that contribute to the sustainability of social, ecological, and economic systems in the plan area.
Contextual Statement	As the largest National Forest east of the Mississippi River, the GWNF provides a wide diversity of opportunities to a very large population. These include recreation opportunities ranging from wilderness to remote backcountry to developed campgrounds in attractive, natural-appearing settings. Mountain biking, horseback riding, hiking and motorized trail use are all important activities. The GWNF provides habitat for a wide variety of species and habitat management activities often result in timber production. Hunting and fishing are also important uses of the Forest.
LMP Desired Condition Statement	See Forest Plan Chapter 2 Desired Conditions for Recreation, Trails, Scenery, Heritage Resources, Geologic Resources, Lands and Special Uses, Roads and Facilities, Timber Management, Mineral Resources, and Drinking Water
Objectives	See Forest Plan Chapter 3 Objectives for Recreation, Scenery, Timber Management, and Wilderness, Roadless Areas, Eligible Wild and Scenic Rivers
Desired Trend Statement	Trends in monitoring measures indicate either progress toward or alignment between desired conditions, desired settings, and desired opportunities
Monitoring Questions	What is the status and trend of settings and opportunities provided by the NFS unit compared to Desired Conditions stated in the LMP? How are management actions maintaining or improving Desired Conditions for settings and opportunities provided by the NFS unit, including contributions to sustaining social systems within the unit's LMP analysis area? How do people involved in the adaptive planning process interpret settings and opportunities provided by the NFS unit compared with Desired Conditions? Do they think there is a need for change?
LMP Performance Measures	Settings and opportunities associated with social systems (e.g., via facilities, Wilderness, open space, scenery, recreation infrastructure, access, accessibility, commodity production, special use permits, visitor days, outfitter guide permits, etc.) Other as appropriate • Acres and location of ROS classes • Incidents of ATV and OHV violations (discernible routes and miles, violations per patrol-day, etc.) • Backcountry campsite conditions (dispersed recreation sites) • NVUM survey indicators • customer satisfaction comment cards (completed at campgrounds) • condition surveys • contributions toward meeting national accessibility targets • Developed recreation sites meet regional quality standards • National accessibility standards and targets met • Acres and location meeting Scenic Integrity Objectives • Progress toward restoring historic landscape character when natural fire influenced scenic integrity

Theme 4	*T4.1 Diversity of Opportunities and Settings*
	• Ecological intactness relative to long-term scenery and scenic integrity: scenic effect of ecological processes and conditions • Number of acres under lease for oil and gas development • Progress toward meeting the 10-Year Wilderness Stewardship Challenge objectives • Heritage Program performance indicators (Heritage Program Managed to Standard, Heritage Program Plan, National Register eligibility, priority heritage assets, volunteer opportunities)
Data Sources	Data is available from existing programs, such as NVUM, budgets, and contracting information. Existing INFRA databases. Special Use Database (SUDS) is available to track special uses.
Importance	An overall goal of the NFS is to contribute to sustaining the social and economic systems within LMP plan areas. Our ability to characterize the diversity of settings and associated opportunities provided by NFS units is essential for us to tell an integrated story of delivering multiple social and economic benefits to diverse communities. All agency goals have social dimensions and the settings and opportunities provided are especially useful for showing how agency goals are interrelated.
What it Tells Us	It enables us to tell how we are doing in our efforts to (1) contribute to sustaining social systems affected by FS activities and (2) provide settings and opportunities that contribute to maintenance or achievement of sustainable social, ecological, and economic systems. It enables us to tell whether we are providing opportunities consistent with desired conditions. And it enables us to describe our need to change or continue forest and grassland strategies in response to the combination of changing public demands, ecological conditions, and fiscal constraints.

Theme 5	***T5.1 Provision of Goods and Services***
Theme 5	**Maintenance and Enhancement of Economic Systems:** Given the opportunities and settings, suitable uses, and activities designed to make progress towards desired conditions, there are goods and services that come off the land. This theme is about goods and services derived from the opportunities and settings referenced the social theme (T-4). Key contributions of goods and services include revenue and jobs associated with recreation, tourism, resident amenities, environmental services, and commodities such as AUMs and the potential for timber production.
Sub-element NFS Generic Desired Condition	***T5.1 Provision of Goods and Services*** Goods and services provided by or derived from the GWNF contribute to sustaining economic systems in the plan area.
Contextual Statement	Contributions to economic sustainability are reflected in traditional financial measures, amenity values derived from living, working, or owning property within the plan area of analysis, and from non-market valuation of benefits, such as recreation days or environmental services. We want to monitor product and/or financial measures affected by LMP implementation so we have an indication of how opportunities and setting provided are contributing to local economies within the plan area.
LMP Desired Condition Statement	See Forest Plan Chapter 2 Desired Conditions for Recreation, Timber Management, and Mineral Resources
Objectives	See Forest Plan Chapter 3 Objectives for Timber Management
Desired Trend Statement	Trends in goods and services derived from or provided by the GWNF are consistent with near-term and long-term progress towards desired conditions.
Monitoring Questions	What are the status and trends of goods and services provided from the unit with regards to progress towards desired conditions? How do these goods and services contribute to key opportunities for sustaining economic systems relevant to the plan area?
LMP Performance Measures	Value and quantities of goods and services: (e.g., the following might apply) • Wellheads for production • Mineral materials removed • MMCF offered • MMCF sold • Permits, etc. • Employment and labor income attributable to goods and services provided by NFS management in the plan area.
Data Sources	Resource data availability is generally good at the broad scale within the Forest Service through IMPLAN (Impact Analysis for Planning—an input-output model), and Forest-level specialist reports. NVUM (National Visitor Use Monitoring) data, recreation and wildlife visits and spending, volume of timber harvested and minerals extracted.

Theme 5	*T5.1 Provision of Goods and Services*
Importance	An overall goal for NFS planning is to contribute to sustaining the social and economic systems within the plan area. While the Maintenance and Enhancement of Social Systems Theme characterizes settings and opportunities provided the public, the Maintenance and Enhancement of Economic Systems Theme characterizes the associated economic outcomes of the settings and opportunities provided. Management of National Forests and Grasslands generates commodity and non-commodity goods and services. Examples include timber and non-timber forest products, range forage, recreation opportunities, water, minerals, energy resources, and various other environmental goods and services. Such complex economic systems involve many participants. Responsible Officials decisions impact multi-scale economies whether the Forest is a major or minor contributor. Regardless of the magnitude of contribution, stability and trend of labor and employment contributions and the impact of goods and services on local economies tend to be common concerns across many NFS units. Additionally, "how" we impact economic systems is not limited to magnitude of quantified valuation, but also includes more subtle qualitative relationships, e.g. the economic activity spawned by wildlife viewing or scenic byways.
What it Tells Us	This sub-element allows us to measure contributions to economic systems that are relevant to the plan area and that are attributable to NFS management. It also allows us to measure our efforts in contributing to economic systems using an interdisciplinary and collaborative approach.

Theme 6	***T6.1 Roads and Trails***
Theme 6	**Infrastructure Capacity:** This theme addresses NFS infrastructure's ability to contribute to the aspirations characterized in the LMP.
Sub-element NFS Generic Desired Condition	***T6.1 Roads and Trails*** The road and trail system on the NFS unit is safe, reflects appropriate access, considers needs of adjacent landowners, and meets public demand.
Contextual Statement	The GWNF is projected to have the most area of increases in housing density of all national forest with projected changes on more than 1.4 million adjacent private rural acres by 2030. This will increase use of the Forest and place added demands on infrastructure.
LMP Desired Condition Statement	See Forest Plan Chapter 2 Desired Conditions for Trails, Lands and Special Uses, and Roads and Facilities
Objectives	See Forest Plan Chapter 3 Objectives for Recreation, Roads and Facilities Scenery, and Lands and Special Uses
Desired Trend Statement	Deferred maintenance needs and environmental impacts of the road and trail system within the plan area are stable or declining. Suitable recreation opportunities provided by the road and trail system are increasing.
Monitoring Questions	How many miles of the designated roads and trails meet standard? Where is unauthorized use occurring on or off the road and trail system and is unauthorized use increasing or decreasing? Are the impacts from the road and trail system on soils, water quality, wildlife, and other natural and cultural resources sustainable and within acceptable tolerance? Is the road and trail system serving its intended purposes and addressing recreational demands?
LMP Performance Measures	Miles and percent of road and trail network maintained to standard. Percent of road miles decommissioned compared to target decommissioning
Data Sources	Infra roads, Infra trails, Infra ATM
Importance	Management of trail and road systems can have important effects on land productivity and the accomplishment of desired conditions. Nationally, the Forest Service manages 125,000 miles of National Forest System trails, including portions of 6 national scenic trails and 11 national historic trails, and 386,000 miles of National Forest System roads. This system of roads and trails provides recreational and administrative access and transportation for goods and service providers. It is essential to the Forest Service's capacity to contribute to social, economic, and ecological sustainability, which is an overall goal for NFS management. A well-maintained system provides transportation and recreation opportunities while contributing towards desired ecological conditions.
What it Tells Us	Knowing the status and condition of our road and trail systems inform our efforts to (1) contribute to sustaining social systems affected by FS activities and (2) provide settings and opportunities that contribute to maintenance or achievement of sustainable social, ecological, and economic systems. It highlights the threats of unmanaged recreation, especially OHV recreation, and whether we are providing opportunities consistent with desired conditions. It tells us how well we provide for outdoor recreation and for support for resource protection activities such as wildfire mitigation.

One additional monitoring question is what is the impact of climate change on the planning area? The types of changes that are anticipated are changes in the ecologic characteristics, species needs, and soil and water characteristics that are monitored as part of the previous six themes. Monitoring for climate change will not necessarily entail additional monitoring actions, but will involve close coordination in the evaluation of monitoring results to put them into the context of larger scale monitoring for climate change.

RESEARCH NEEDS

Research and monitoring are related activities that help to meet information needs for adaptive management of national forests. Research involves rigorous study under controlled conditions, following the scientific method. Research activities include study planning, design, quality control, peer review and relatively rigid publication standards. Monitoring is generally conducted under less controlled conditions and results are often more general in contrast with research.

Research needs for management of the National Forests are to be identified during planning and periodically reviewed during monitoring and evaluation of implemented Forest Plans (36 CFR 219.28).

The Forest Service Research Branch is the largest forestry research organization in the world and a national and international leader in forest conservation. Agency research contributes to the advancement of science and the conservation of many of our Nation's most valuable natural resources, both on private lands and the National Forests. Research needs identified during planning, monitoring and evaluation are to be included in formulating overall research programs and plans for Forest Service Research to support or improve management of the National Forests.

Research needs identified during development of this Forest Plan are listed in Appendix G. Research needs identified while monitoring the implementation of the Forest Plan will be reported in Annual Monitoring and Evaluation Reports.

AMENDMENTS

The Forest Plan can be amended at any time during its existence. Such amendments are necessary to ensure that the Plan remains a viable, flexible document for managing the Forest.

Errata sheets may be issued if necessary to correct spelling or grammatical errors, which may lead to confusion in the Forest Plan. Such changes are not considered amendments.

The Forest Plan may also be amended as part of a project-level decision where a change or adjustment in the Forest Plan is appropriate for that project but is not applicable to the entire Forest. Examples of such changes might be adjustments to, or waivers of, standards.

If it is determined during project design that the best method of meeting the management area goals of the Forest Plan is in conflict with either Forest or management area standards, the Forest Supervisor may approve a project-specific amendment to the Forest Plan.

REVISION

This Forest Plan will be revised on a 10-year cycle or at least every 15 years. It may also be revised whenever the Forest Supervisor determines that conditions or demands in the area covered by the Forest Plan have changed significantly or when changes in policies, goals, or objectives would have a significant effect on the Forest-level programs. In the monitoring and evaluation process, the interdisciplinary team may recommend a revision of the Forest Plan at any time.

Future revisions are not effective until considered and approved in accordance with the requirements for the development and approval of a Forest Plan. The Forest Supervisor will review the conditions on the land

covered by the Forest Plan at least every 5 years to determine whether conditions or demands of the public have changed significantly

APPENDIX A: DEFINITION OF RIPARIAN CORRIDOR

RIPARIAN CORRIDORS VERSUS RIPARIAN AREAS

Riparian Areas are functionally defined as areas with three-dimensional ecotones of interaction that include both terrestrial and aquatic ecosystems. They extend down into the groundwater, up above the canopy, outward across the floodplain, up the near-slopes that drain into the water, laterally into the terrestrial ecosystem, and along the watercourse at a variable width (Ilhardt et al. 2000). A **Riparian Corridor**, on the other hand, is a management prescription area designed to include much of the Riparian Area. Within the riparian corridor management prescription area, management practices are specified to maintain riparian functions and values. As a management prescription area, this includes corridors along all defined perennial and intermittent stream channels that show signs of scour, and around natural ponds, lakeshores, wetlands, springs, and seeps.

DETERMINATION OF RIPARIAN CORRIDORS

Due to their spatial extent, riparian corridors are not identified on the Forest Plan map of prescription allocations. Estimated acreages of the Riparian Prescription allocations are based on the widths described in Tables in A-1 and A-2. For project planning and implementation, the following process will be used to determine the extent of site-specific riparian corridors.

Riparian corridor widths are designed to encompass the riparian area defined on the basis of soils, vegetation and hydrology and the ecological functions and values associated with the riparian area. The widths in Tables A-1 and A-2 shall be used to define the riparian corridor if the corridor is not site-specifically determined as described below.

If a site-specific field investigation determines the need to vary the widths in Table A-1 and A-2, that width shall become the project level riparian corridor. This corridor shall be determined by an interdisciplinary analysis using site-specific information to ensure that riparian values and functions are maintained.

The slope-dependent riparian corridor widths are measured in on-the-ground surface feet perpendicular from the edge of the channel or bank (stream, waterbody, etc.) and extend out from each side of a stream. For ponds, lakes, sloughs, and wetlands (including seeps or springs associated with wetlands) the measurement would start at the ordinary high water mark and go around the perimeter. For braided streams, the outermost braid will be used as the water's edge. An interrupted stream (a watercourse that goes underground and then reappears) will be treated as if the stream were above ground. (An acceptable level of error for on-the-ground measurements of these widths is $\pm$ 10%.) The riparian corridor includes human-created reservoirs, wildlife ponds, wetlands, and waterholes connected to or associated with natural water features. In addition, those areas not associated with natural water features, but support riparian flora or fauna, will have a riparian corridor designation. The riparian corridor management direction does not apply to constructed ponds developed for recreation uses; or to human-made ditches, gullies, or other features that are maintained or in the process of restoration. For these areas, site-specific analysis will determine appropriate protective measures. (See also the Forestwide Standards in Chapter 4.)

Tables A-1 and A-2 do not apply to constructed ponds developed for recreation uses; or to human-made ditches, gullies, or other features that are maintained or in the process of restoration. For these areas, site-specific analysis will determine the appropriate protective measures.

Table A-1. Riparian Corridor Minimum Widths for Perennial Streams, Lakes, Ponds, Wetlands, Springs or Seeps

Slope Class	0-10% Core Area	11-45% Core + Extended Area	45%+ Core + Extended Area
Minimum width in feet (as described above)	100	125	150*

Table A-2. Riparian Corridor Minimum Widths for Intermittent Streams

Slope Class	0-10% Core Area	11-45% Core + Extended Area	45%+ Core + Extended Area
Minimum width in feet (as described above)	50	75*	100*

* The Extended Area is the outer 25 feet (on 11-45 % slopes) and 50 feet (on 45% and greater slopes).

OVERVIEW OF RIPARIAN CORRIDORS

The figure below is a simplified representation of the Riparian Corridor that demonstrates its extension on both sides of a watercourse, down into the water table, and laterally around wetlands and other surface water sources. The Riparian Corridor may fall within or beyond the true Riparian Area.

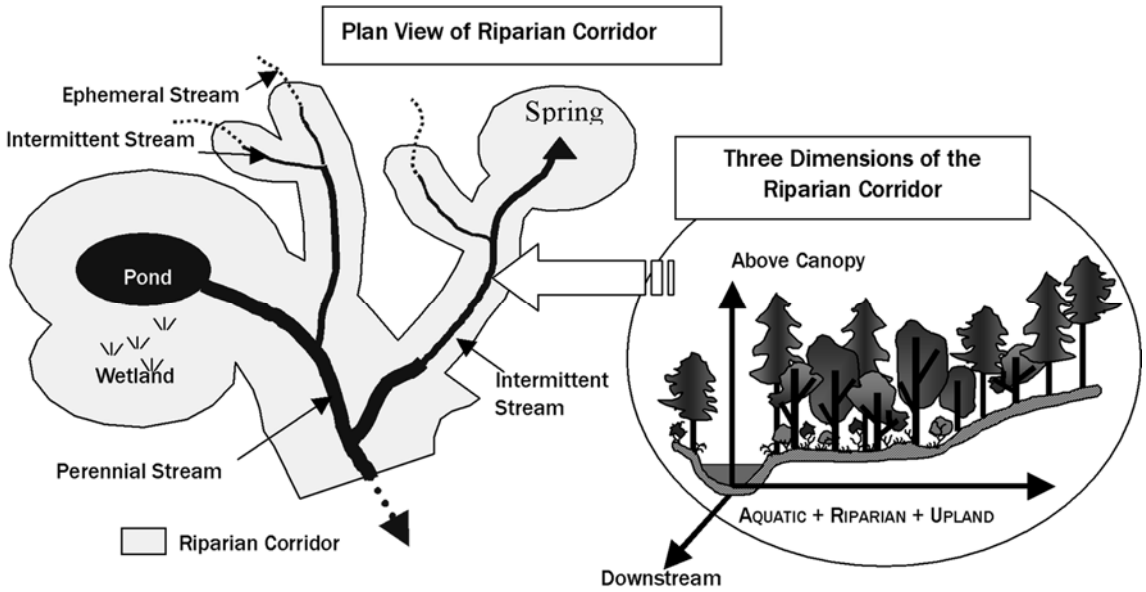

Figure A-1. Simplified Representation of a Riparian Corridor

OPERATIONAL DEFINITION FOR A RIPARIAN AREA

Riparian Areas are areas associated with the aquatic ecosystem and that portion of the terrestrial ecosystem that is substantially affected by the presence of surface and groundwater. Riparian areas consist of perennial streams, natural ponds, lakes, wetlands, and adjacent lands with soils, vegetation and landform indicative of high soil moisture or frequent flooding. Riparian areas have variable widths that are determined by ecologically significant boundaries rather than arbitrary distances. The extent of riparian areas is determined on-the-ground using features of soil, landform, and vegetation. No feature is used alone to delineate these ecosystems. Characteristics indicative of these areas are:

- Soils – dark colored Entisols, Inceptisols, and Mollisols;
- Landform – the 100-year floodplain;
- Vegetation – the presence of wetland plants classified as obligates or facultative wetland species as defined by the U.S. Fish and Wildlife Service in the National List of Plants that Occur in Wetlands: Northeast (Region 1). (Reed, P.B., Jr., 1988).

RELATIONSHIP WITH OTHER MANAGEMENT PRESCRIPTIONS

The Riparian Corridors overlap with other management prescription allocations. In order to establish precedence, the following rules apply:

Where the Riparian Corridor management prescription area overlaps with lands that have been allocated to the following Management Prescriptions, then whichever management direction is the most restrictive will apply:

- 1A or 1B – Wilderness and Recommended Wilderness Study,
- 2C2 or 2C3 – Eligible Scenic and Recreational Rivers,
- 8E7 – Shenandoah Mountain Crest
- 8E4a – Indiana Bat Primary Cave Protection Area,
- 12D - Backcountry Recreation Areas

For lands allocated to any of the other management prescriptions, where the riparian corridor overlaps with these allocations, the direction in the Riparian Corridor Management Prescription will take precedence.

RELATIONSHIP WITH BEST MANAGEMENT PRACTICES

This Forest Plan meets or exceeds State Best Management Practices. Current State BMP handbooks or manuals are incorporated as direction in the Forest Plan and are implemented for those resource management activities that are covered by the handbooks/manuals. Standards for activities not included in BMP handbooks/manuals are included in Chapter 4 of this Forest Plan.

The Streamside Management Zones (SMZ) recommended in State BMPs are designated areas directly adjacent to streams and water bodies where land management activities are controlled or regulated to primarily protect water quality and aquatic organisms from upslope land uses. Provisions within the SMZ typically contain sediment filter strips, a base shade level, restriction on ground disturbance and protection of stream banks and streambeds. As described, Riparian Corridors are management prescription areas that maintain ecological processes and functions. SMZs may be the same width or smaller than the riparian corridor, however, in some cases they may extend beyond the corridor.

RELATIONSHIP WITH CHANNELED EPHEMERAL STREAMS

Ephemeral streams do not have true riparian areas but are hydrologically connected to perennial and intermittent streams. Channeled Ephemeral Stream Zones include and are directly adjacent to all scoured ephemeral channels. Standards for the Channeled Ephemeral Zone are found in Chapter 4 of this Forest Plan. The primary purpose of this zone is to maintain the ability of the land to filter sediment from upslope disturbances while achieving the goals of the adjacent management prescription area. In addition, the emphasis along ephemeral streams is to maintain channel stability and sediment control by keeping vehicles away from stream banks and maintaining, restoring, or enhancing large woody debris. The management direction in this zone reflects the adjacent management prescription and may be modified as a result of watershed analysis.

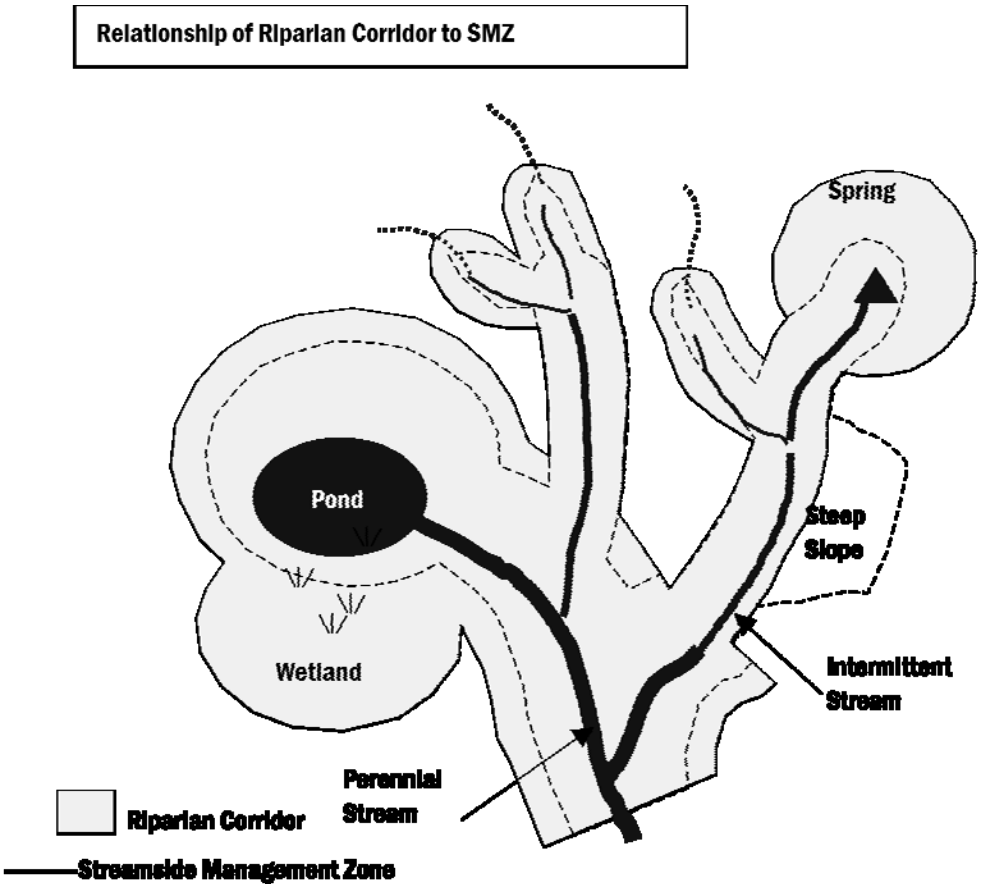

Figure A-2. Relationship of Riparian Corridor to Streamside Management Zone

APPENDIX B: OLD GROWTH STRATEGY

OLD GROWTH DEFINITIONS AND INVENTORY CRITERIA

Management of old growth in the George Washington Forest Plan is based upon the report of the Region 8 Old Growth Team entitled *Guidance for Conserving and Restoring Old Growth Forest Communities on National Forests in the Southern Region, Forestry Report R8-FR 62, 1997* (Old Growth Guidance). The Old Growth Guidance defines three terms used by national forests in the Southern Region when describing old growth: Existing Old Growth, Possible Old Growth and Future Old Growth.

Existing Old Growth: forest stands or patches that have been determined to meet the age, disturbance, basal area, and tree size criteria described in the operational definitions for the 16 old growth forest community types of the Southern Region. A stand or patch must meet all four criteria in order to be classified as Existing Old Growth.

Possible Old Growth: forest stands which meet the preliminary inventory criteria in Table B-1 from the Old Growth Guidance based on stand age from current FSVEG data. Although not all of these stands would likely meet all four criteria for Existing Old Growth, this is the best estimate of the acreage and location of old growth on the GWNF.

Future Old Growth: stands or patches that may, or may not, currently meet the operational definition for Existing Old Growth, but are allocated to management prescription areas that will not allow timber harvest and thus allow the stands to mature and develop old growth attributes.

The determination of a stand's status as Existing Old Growth is based on the old growth forest type (OGFT), age, basal area, tree size and past disturbance as defined in Table B-1.

The minimum age criterion is generally applicable for the oldest age class in a stand when approximately 30 trees per acre meet that criterion for the deciduous forest community types and at least 10 trees per acre for the pine forest community types. The largest trees diameter at breast height (dbh) criterion is generally applicable when at least 10 trees per acre are present for all forest community types. The minimum basal area is a measurement of stand density and is a conservative estimate to ensure that stands are not excluded due to the variety of ecological conditions which exist. Tree sizes for inclusion in the estimate of stand basal area will follow the Forest Service silvicultural stand examination protocols for pine and hardwood species. The fourth attribute is past disturbance. However, the acceptable level of past human disturbance can prove difficult to quantify. For this reason, a "coarse, non-quantified, and common sense" approach will be used when considering past human disturbance. For a stand to be considered as Existing Old Growth, no obvious evidence of past human disturbance which conflicts with the old growth characteristics of the area should be present, such as powerline corridors. Recent vegetative management activities which maintain characteristics consistent with old growth usually do not disqualify an area as Existing Old Growth. Examples of these activities may include commercial thinnings, mid-story treatments, prescribed fire, or interpretive trails.

Table B-1. Operational Criteria for Determining Existing Old Growth

Old Growth Forest Community Type	Minimum Age of the Oldest Age Class	Minimum Basal Area (square feet/acre)	Largest Trees (dbh)
1 - Northern Hardwood	100	40	14
2a, 2b, 2c - Conifer Northern Hardwood Subgroups	140	40	20
5 - Mixed Mesophytic	140	40	30
10 – Hardwood Wetland	120	40	16
21 - Dry-Mesic Oak	130	40	20
22 - Dry and Xeric Oak Forest, Woodland and Savannah	110	40	16
24 - Xeric Pine and Pine-Oak Forest and Woodland	100	20	20
25 - Dry and Dry-Mesic Oak-Pine	120	40	19
28 – Eastern Riverfront	100	40	25

Table B-2 provides a crosswalk between the Old Growth Forest Types and the Forest Types that are used in the silvicultural stand examination inventory database, FSVEG.

Table B-2. Crosswalk Between Old Growth Forest Community Types and FSVEG Forest Types

Old Growth Forest Community Type	FSVEG Forest Types
1 - Northern Hardwood	Sugar maple-Beech-Yellow birch (81)
2a, 2b, 2c - Conifer Northern Hardwood	Red pine (2), White pine (3), White pine-Hemlock (4), Hemlock (5), Fraser fir (6), Red spruce-Fraser fir (7), Hemlock-hardwood (8), White pine-Cove hardwood (9), White pine-Upland hardwood (10), Red spruce-Northern hardwood (17)
5 - Mixed Mesophytic	Cove hardwood-White pine-Hemlock (41), Yellow poplar (50), Yellow poplar-White oak-Red oak (56), Sweet gum-Yellow poplar (58), Black cherry (70), Black walnut (82)
10 – Hardwood Wetland	Black ash-American elm-Red maple(71)
21 - Dry-Mesic Oak	Chestnut oak (52), White oak-Red oak-Hickory (53), White oak (54), Northern red oak (55), Scarlet oak (59), Chestnut oak-Scarlet oak (60)
22 - Dry and Xeric Oak Forest, Woodland and Savannah	Post oak-Black oak (51)
24 - Xeric Pine and Pine-Oak Forest and Woodland	Shortleaf pine-Oak (12), Pitch pine-Oak (15), Virginia pine-Oak (16), Table mountain pine-Hardwood (20), Loblolly pine (31), Shortleaf pine (32), Virginia pine (33), Eastern red cedar (35), Pitch pine (38), Table mountain pine (39), Bear oak-Southern scrub oak-Yellow pine (49), Scrub oak (57)
25 - Dry and Dry-Mesic Oak-Pine	Upland hardwood-White pine (42), Chestnut oak-Scarlet oak-Yellow pine (45), Bottomland hardwood-Yellow pine (46), White oak-Black oak-Yellow pine (47), Northern red oak-Hickory-Yellow pine (48)
28 – Eastern Riverfront	River birch-Sycamore (72), Cottonwood (73), Sycamore-Pecan-American elm (75)

The age at which old growth develops and the specific structural attributes that characterize old growth can vary widely according to forest type, climate, site conditions and disturbance regimes. Old growth in fire-dependent forest types may not differ greatly from young forests in the number of canopy layers or accumulation of downed woody material. However, old growth is typically distinguished from younger growth by several of the following attributes:

- Large trees for the species and site.
- Wide variation in tree size and spacing.
- Accumulations of large-sized, dead, standing and fallen trees.
- Decadence in the form of broken or deformed tops or boles and root decay.
- Multiple canopy layers.
- Canopy gaps and understory patchiness.

Additional information regarding the old growth forest community types can be found in the Old Growth Guidance.

OLD GROWTH STATUS ON THE FOREST

Existing Old Growth. Few stands of Existing Old Growth have been documented on the GWNF. Stands of OGFT 2a–Hemlock-Northern Hardwood have been identified in the Little Irish Creek and Statons Creek Special Biological Areas and along Skidmore Fork in the Shenandoah Mountain Crest area. These areas are all dominated by hemlock that has now died due to hemlock wooly adelgid.

Possible Old Growth. While few stands have been documented as Existing Old Growth, about 245,000 acres meet the minimum stand age criterion for old growth and are identified in Table B-3 as Possible Old Growth.

The forest continues to age and much of the forest is moving towards old growth conditions, with 70% of the acres aged 90 and older. Table B-3 also shows the progression of acres meeting the stand age criteria in the next 10 years and in the next 50 years. The last column in Table B-3 shows the percentage of acres that currently meet the age criterion for old growth that are within management prescriptions that do not allow timber production. The table shows that in another ten years, an additional 120,000 acres will meet the age definitions for Possible Old Growth, an increase of about 50 percent over the current acreage. More than half of the acreage of the current Possible Old Growth and the Possible Old Growth in 2020 is located in management prescriptions that will retain the old aged stands. Aging the stands out 50 years to 2060 results in slightly less than half of the total stands will be in old growth, but the total acreage of old growth is nearly four times current levels and all old growth forest types are well represented (except for the riverine systems).

Table B-3. Current Acres of Possible Old Growth Compared to 10 Years and 50 Years in the Future

Old Growth Forest Community Type	Total Acres in All Age Classes	Acres Possible Old Growth Current, 2010	Acres Possible Old Growth in 2020	Acres Possible Old Growth in 2060	% of Current Possible Old Growth in Management Prescriptions that are Unsuitable for Timber Production
01 - Northern Hardwood	9,644	1,263	4,491	8,457	91%
02a - Hemlock-Northern Hardwood	6,570	2,494	3,010	5,194	94%
02b - White Pine-Northern Hardwood	37,682	688	1,741	9,888	40%
02c - Spruce Northern Hardwood	524	118	118	255	100%
05 - Mixed Mesophytic	57,372	5,064	7,936	32,905	61%
10 - Hardwood Wetland Forest	111	0	0	0	0%
21 - Dry-Mesic Oak Forest	678,550	151,371	207,224	598,663	54%
22 - Dry and Xeric Oak Forest	492	331	467	467	48%
24 - Xeric Pine and Pine-Oak Forest and Woodland	124,264	66,468	101,758	118,709	46%
25 - Dry and Dry-Mesic Oak-Pine	122,515	16,850	36,224	113,658	56%
28 - Eastern Riverfront	194	6	25	76	0%
Total	1,037,918	244,653	362,996	888,271	53%

Future Old Growth. While some stands will be harvested during plan implementation, other stands are allocated to management prescriptions that are unsuitable for timber production. Allocations of lands to these management prescription areas will result in stands that are capable of developing old growth as the forest ages. These management prescription areas include Wilderness, recommended Wilderness study areas, National Scenic Areas, recommended National Scenic Areas, Shenandoah Mountain crest, remote backcountry, wild and scenic river corridors, Appalachian Trail corridor, Research Natural Areas, geologic areas, special biological areas, key natural heritage community areas, dispersed recreation areas that are unsuitable for timber production, Indiana bat primary conservation areas, and riparian areas. Most of these areas provide large patches (2,500 acres or larger) and medium patches (100 to 2,499 acres) of old growth that fit into a network of varying size patches distributed across the national forest landscape. These areas comprise about 460,000 acres (Table B-4). The distribution of this Future Old Growth by OGFT is also displayed in Table B-4.

Table B-4. Current (2010) Possible Old Growth (age defined) and Future Old Growth (management prescription is unsuitable for timber production)

Forest Community	Total Acres in All Age Classes	Current Acres Possible Old Growth	Acres Future Old Growth
01 - Northern Hardwood	9,644	1,263	7,896
02a - Hemlock-Northern Hardwood	6,570	2,494	4,960
02b - White Pine- Northern Hardwood	37,682	688	7,780
02c - Spruce Northern Hardwood	524	118	420
05 - Mixed Mesophytic	57,372	5,064	25,629
10 - Hardwood Wetland Forest	111	0	0
21 - Dry-Mesic Oak Forest	678,550	151,371	301,563
22 - Dry and Xeric Oak Forest	492	331	211
24 - Xeric Pine and Pine-Oak Forest and Woodland	124,264	66,468	56,299
25 - Dry and Dry-Mesic Oak-Pine	122,515	16,850	55,010
28 - Eastern Riverfront	194	6	129
Total	1,037,918	244,653	459,897

OLD GROWTH NETWORK AND REPRESENTATION

Through allocation of management prescription areas, identification of lands unsuitable for timber production, and the current distribution of older aged stands across the Forest, this Forest Plan establishes a network of old growth areas. This network consists of a mix of large, medium, and small patches embedded in a forest matrix dominated by mid and late successional forests where old growth areas are generally interconnected by mature forests. Large patches are designed to ensure the integrity of ecological functions and the distribution of old growth conditions at the subregional scale. Large patches are greater than 2,500 acres and are established through the allocation of lands in large blocks to management prescription areas like wilderness, recommended wilderness, national scenic areas, recommended national scenic areas, Shenandoah Mountain crest, and remote backcountry. The areas will all become old growth and currently contain about 370,000 acres. This Forest Plan provides large patches of old growth in every Ecological Subsection. All forest community types except OGFT 02c-Spruce Northern Hardwood, OGFT 10-Hardwood Wetland Forest and OGFT28-Eastern Riverfront Hardwoods are represented in these large patches. OGFT 01-Northern Hardwoods, OGFT 02a-Hemlock-Northern Hardwood, OGFT 02b-White Pine-Northern Hardwood, OGFT 05-Mixed Mesophytic Forest, OGFT 21-Dry-Mesic Oak Forest, OGFT 22-Dry and Xeric Oak Forest, OGFT 24-Xeric Pine and Pine-oak Forest and Woodland, and OGFT 25-Dry and Dry-Mesic Oak-Pine Forest communities are represented in one or more large patches. Six of the seven 4th level watersheds contain portions of large old growth patches.

Medium patches are designed to fill in gaps in old growth forest community type representation or to improve the spatial distribution between large-sized areas. Medium patches are greater than 100 acres and are typically a mix of Possible and Future Old Growth. All forest community types except OGFT10-Hardwood Wetland Forest and OGFT 28-Eastern Riverfront Hardwoods are represented in one or more medium patches. Of the 110 6th level watersheds with more than 1,000 acres of NFS lands, 81% have medium patches of Possible Old Growth that are not suitable for timber harvest.

Small patches are typically represented by Possible Old Growth. Small patches are 100 acres or smaller. All forest community types are represented in several to many small patches, with the River Floodplain and

Eastern Riverfront representing the least. Of the 110 6th level watersheds with more than 1,000 acres of NFS lands, 83% have small patches that are not suitable for timber harvest.

Table B-5 displays the current number and acreage of small, medium, and large patches of Possible Old Growth. It also displays the status of patches as the forest ages 10 and 50 years.

Table B-5. Large, Medium and Small Old Growth Patches

Patch Size	Current Condition (2010)			Condition in 10 Years (2020)			Condition in 50 years (2060)		
	# of Patches	Total Acres	% in Prescriptions Not Suitable for Timber Production	# of Patches	Total Acres	% in Prescriptions Not Suitable for Timber Production	# of Patches	Total Acres	% in Prescriptions Not Suitable for Timber Production
Small (1-99 acres)	1,749	58,828	37%	1,846	60,534	35%	234	7,476	13%
Medium (100-2,499 acres)	450	152,714	54%	522	202,909	46%	108	56,050	12%
Large (>2,499 acres)	7	33,111	76%	19	99,553	69%	32	824,745	51%
Total	2,206	244,653	53%	2,387	362,996	51%	374	888,271	48%

The network of old growth patches across the GWNF is distributed across all Ecological Subsections and linked by a forest matrix dominated by mid- and late-successional forest conditions. Important linkages are provided by riparian corridors and unsuitable lands on steeper slopes near the tops of major ridges. Currently there are 151,000 acres of old growth forest type 21 and over half of it is in prescription areas that will maintain the old growth character. In ten years, this would increase to 207,000 acres. In addition, this old growth type is well distributed around the GWNF. Of the 110 6th level watersheds that contain more than 1,000 acres of National Forest System lands, 91 percent of them have Possible Old Growth in forest type 21 that is unsuitable for timber production.

For OGFT 25-Dry and Dry-Mesic Oak-Pine Forest, there are currently 17,000 acres of Possible Old Growth and over half of it is in prescription areas that will maintain the old growth character. In ten years, this would increase to 36,000 acres. In addition, this old growth type is well distributed around the GWNF, though not as well distributed as OGFT 21-Dry-Mesic Oak Forest. Of the 110 6th level watersheds that contain more than 1,000 acres of National Forest System lands, 64 percent of them have Possible Old Growth in OGFT 21 that is unsuitable for timber production.

The OGFT 10-Hardwood Wetland Forest and OGFT 28-Eastern Riverfront forest communities are not well-represented on the GWNF in any age class. These community types are typically found along the banks of large streams and rivers which tend to be in private ownership. These forest communities are restricted to riparian zones where flooding routinely occurs, therefore, the locations of these forests shift as stream and river course change and meander. Newly discovered old growth communities will be managed to retain their old growth character.

The OGFT 02a-Hemlock-Northern Hardwood and OGFT 02b-White Pine-Northern Hardwood forests contain eastern hemlocks which are being severely affected by hemlock wooly adelgid. These forest communities are currently widespread across the riparian areas of the GWNF, but will become increasingly rare as the hemlock wooly adelgid spreads southward. Newly discovered Existing Old Growth communities will be managed to retain their old growth character.

The OGFT 01-Northern Hardwood and OGFT 2c-Spruce-Northern Hardwood forest communities are confined to the higher elevations of the GWNF. They are largely protected in, wilderness and backcountry management prescription areas. Due to the rareness of these communities on the Forest and their importance to a number of threatened, endangered, sensitive, or locally rare species, any newly discovered patches which meet the operational criteria for Existing Old Growth will be managed to retain their old growth character.

The OGFT 05-Mixed Mesophytic forest community is well-distributed throughout the GWNF, particularly in riparian areas and coves. This community is important for many biological, social, and economic reasons. Older trees in this community type are tall and very large in diameter, providing an aesthetic landscape that most people picture when they think of old growth. Newly discovered patches which meet the operational criteria for Existing Old Growth communities will be managed to retain their old growth character.

The OGFT 22-Dry and Xeric Oak Woodlands and the OGFT 24-Xeric Pine and Pine-Oak Forest and Woodland communities have historically experienced frequent fires and are relatively short-lived. Newly discovered patches which meet the operational criteria for Existing Old Growth communities within this type will be managed to retain their old growth character.

The OGFT 21-Dry-Mesic Oak Forest and OGFT 25-Dry & Dry-Mesic Oak-Pine Forest communities are well-represented in both Possible and Future Old Growth; however there are specific forest types within this broader community classification which are not well-represented. When evaluating newly discovered patches which meet the operational criteria for Existing Old Growth in these community types, specific forest types should be considered separately for their contribution to the matrix of large, medium, and small old growth patches. If, during project analysis, it can be demonstrated that an identified Existing Old Growth patch does not contribute to the Forest old growth inventory, then harvest of the patch could occur. The analysis will include a discussion of the old growth characteristics found in the area, the effect of the action on these characteristics, and the effect the action will have on the contribution of the area to the Forest's old growth inventory.

OLD GROWTH MANAGEMENT FOR THE FOREST

Additional Existing Old Growth, as it is identified, will be managed based on the old growth forest type and the representation of that type in the Existing, Possible and Future Old Growth inventories. In OGFT 01-Northern Hardwood, OGFT 02a-Hemlock-Northern Hardwood, OGFT 02b-White Pine-Northern Hardwood, OGFT 02c-Spruce Northern Hardwood, OGFT 05-Mixed Mesophytic, OGFT 10-Hardwood Wetland Forests, OGFT 22-Dry and Xeric Oak Forest, OGFT 24-Xeric Pine and Pine-Oak Forest and Woodland, and OGFT 28-Eastern Riverfront forests, any Existing Old Growth will be unsuitable for timber production. In evaluating the previous old growth forest types, as long as the forest type and stand age meet the definition of old growth, the stand will remain unsuitable, regardless of the other three criteria (basal area, number of large trees or past disturbance). In the OGFT 21-Dry-Mesic Oak Forest and OGFT 25-Dry and Dry-Mesic Oak-Pine forests, any Existing Old Growth in areas that are suitable for timber production will be evaluated to determine its suitability for harvest.

Much of the old growth on the GWNF will be managed to maintain its old growth character through the allocation of lands to management prescriptions as shown in Table B-3 through B-4. In addition, all of the Possible Old Growth stands in the following old growth types have been identified as unsuitable for timber production: OGFT 01-Northern Hardwood, OGFT 02a-Hemlock-Northern Hardwood, OGFT 02b-White Pine-Northern Hardwood, OGFT 02c-Spruce Northern Hardwood, OGFT 05-Mixed Mesophytic, OGFT 10-Hardwood Wetland Forests, OGFT 22-Dry and Xeric Oak Forest, OGFT 24-Xeric Pine and Pine-Oak Forest and Woodland, and OGFT 28-Eastern Riverfront. During field review of these stands, if the stands are correctly identified in forest type and stand age, then the stand will remain unsuitable.

The only stands of Possible Old Growth that can be considered for timber harvest are those in the OGFT 21-Dry-Mesic Oak Forest and OGFT 25-Dry and Dry-Mesic Oak-Pine old growth forest types that are also located in management prescription areas that contain lands suitable for timber production. With the aging of the current forest, there will be a need to harvest stands that meet the definition of old growth if we are to meet our objectives for openings, regenerating forests and open woodlands. Therefore, OGFTs 21 and 25 will be considered for harvest. These types are well represented in the inventory of Possible Old Growth.

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APPENDIX C: TIMBER ANALYSES

INTRODUCTION

This appendix describes the analysis of lands suitable and not suitable for timber production, the Allowable Sale Quantity (ASQ), Total Timber Sale Program, and describes conditions where different silvicultural systems could be used.

LANDS SUITABLE FOR TIMBER PRODUCTION

During forest land and resource management planning, the Forest Service is required to identify lands unsuited for timber production (16 USC 1604(k); 36 CFR 219.14). 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. For purposes of forest planning, timber production does not include the production of fuelwood or harvests from unsuitable lands." (36 CFR 219.3, 1982 rule). This identification process involves three stages of analysis. Stage I analysis identifies lands tentatively suitable for timber production. Stage II analysis is designed to explore the financial aspect of varying intensities of timber management on lands identified as tentatively suitable for timber production from Stage I. Stage III analysis identifies lands as unsuited for timber production as determined by the desired conditions and land allocations in the Forest Plan.

STAGE I: PHYSICAL SUITABILITY

The first stage of the timber suitability analysis addresses the administrative and physical suitability of the land to be managed for the production of timber. Stage I lands unsuitable for timber production include:

- Lands that do not meet the definition of forest land (land at least 10% occupied by forest trees of any size).
- Lands that have been administratively or congressionally withdrawn from timber production by an act of Congress, the Secretary of Agriculture, or the Chief of the Forest Service.
- Forest lands incapable of producing industrial wood.
- Lands where technology is not available to ensure timber production from the land without irreversible soil and water resource damage.
- Lands where there is no reasonable assurance that they can be adequately restocked.
- Lands where there is inadequate information.

Table C-1 describes the information used to estimate the acreage within the six categories of the Stage I tentatively suitable lands.

Table C-1. Tentatively Suitable Lands, Stage I Suitability Analysis

Categories of Stage I Unsuitable Lands	Defining Information	Current Net Acres
Total National Forest System Lands:		1,065,000
Non Forest Land	FSVeg Land Class Codes: 110-Lake 120-Reservoir 140-River 210-Cemetery 220-Powerline 230 Road/Railroad 240-Special Use 250-Wildlife Clearing	(7,000)
Withdrawn	Designated Wilderness (1A) Mt. Pleasant National Scenic Area (4F) Research Natural Areas (4B)	(53,000)
Irreversible Damage	Land Class Code: 826 - Physical barriers AND Site Index < 70	(28,000)
Can't Restock	Forest Type: 99 – Brush AND Stand Condition Class: 15 – Non Stocked	(1,000)
Incapable of producing industrial wood	Land Class Code: 900 – Incapable of Industrial Wood OR Site Index < 40	(65,000)
Tentatively Suitable Forest Lands		**911,000**

It is important to note that the net acres displayed in Table C-1 refer to the acres within that particular category that have not already been removed in a previous category. For instance, there are a total of some 41,000 acres on the Forest that meet the criteria for 'Irreversible Damage and Can't Restock', but only about 29,000 are shown as removed because the other 12,000 acres were already removed by the 'Withdrawn' category.

STAGE II: FINANCIAL ANALYSIS

The second stage analysis is designed to explore the financial efficiency of different timber intensities on the lands identified as tentatively suitable for timber production in Stage I. It does not identify any lands as unsuitable for timber production. Stage III analysis considers the results of these financial efficiencies in making the final determination of lands suited for timber production.

STAGE III: IDENTIFICATION OF SUITABLE ACRES

The third stage analysis is determined by Forest Plan direction. Several criteria were used during this stage to identify lands in this category:

- Based upon consideration of multiple-use objectives, the land is proposed for resource uses that preclude timber production. However, in some management prescription areas that are classified as unsuitable for timber production, timber harvest may occur to meet the desired condition of other resources.
- Other management objectives limit timber production activities to the point where management requirements set forth in 36 CFR 219.27 cannot be met.
- The lands are not cost-efficient, over the planning horizon, in meeting forest objectives, which includes timber production.

Table C-2 describes the information used to estimate the final acres suitable for timber production from considering all three stages of analyses.

Table C-2. Determination of Acres Suitable for Timber Production for Stage III Suitability Analysis

Categories of Stage III Unsuitable Lands	Defining Information	Current Net Acres
Tentatively Suitable Forest Lands from Stage I Analysis		911,000
Withdrawn for Other Resource Purposes by Management Prescription Area	Recommended Wilderness Study (1B) Eligible Scenic River Corridors (2C2&3) Appalachian National Scenic Trail Corridor (4A) Geologic (4C1) Special Biological Areas (4D) Key Natural Heritage Community Areas (4D1) Special Heritage (4E) Shenandoah Mountain Recommended National Scenic Area (4FA) All Administrative Areas (5A, 5B, 5C) Concentrated Recreation (7D) Dispersed Recreation-Unsuitable for Timber Production – (7E1) Blue Ridge Parkway Corridor (7F) Pastoral Landscapes (7G) Indiana Bat Primary (8E4a) Riparian Corridors (11) Remote Backcountry (12D) Possible Old Growth not in Old Growth Forest Types 21 & 25	(344,000)
Lands Not Appropriate Because They Are Not Cost-Effective to Achieve Timber Production Goals	Site Index <= 40 or Slope >55% and Forest Type <> 48, 53, 56 and 81*	(115,000)
Total Suitable Land		**452,000**

* Forest types 48, 53, 56, and 81 are northern red oak-hickory-yellow pine, white oak-red oak-hickory, yellow poplar-white oak-red oak, and sugar maple-beech-yellow birch, respectively.

Lands suitable for timber production are located in eight management prescriptions. These prescriptions contain both suitable and unsuitable lands. Final determination of suitability for timber production is determined at the site-specific project level. During this project level determination, lands identified as suitable for timber production must total no more than 452,000 acres across the forest.

TIMBER SALE PROGRAM

The Allowable Sale Quantity (ASQ) is defined as the maximum amount of timber that may be sold on lands suitable for timber production during a decade of implementing the Forest Plan (FSH 2409.13). The ASQ plus volume produced on lands unsuitable for timber production through achievement of desired conditions or salvage operations comprise the total Timber Sale Program. However, the volume from timber harvest that may occur on unsuitable lands to support other resource objectives (non-scheduled volume) is incidental and difficult to quantify. Table C-3 displays a breakdown of the ASQ and Total Timber Sale Program for the first decade of the Revised Plan. The ASQ is a decadal ceiling; there are no constraints on the amount of volume that can be sold annually on the Forest.

Table C-3. ASQ and Total Timber Sale Program for the First Decade

Total Allowable Sale Quantity	55.3 MMCF
Total Non-Scheduled Volume	0 MMCF
Total Timber Sale Program Quantity	55.3 MMCF

The silviculture/timber sale program areas apply active management to the overstory, midstory and understory vegetation in order to move the forest toward desired conditions (see Chapter 2, DC-ESD-1 through DC-ESD-12). Activities described in this section include timber sales such as intermediate timber harvest (thinning), and silvicultural harvest treatments that are even-age in nature (clearcut, or two-age regeneration), or uneven-age (group selection). The estimated or projected size of the silviculture program (acres of management activity) is based on the ecological needs of the resource, and historical budget and personnel levels for the George Washington National Forest. The following table shows the estimated average annual silvicultural treatments, acres treated and volume to be applied to the GWNF for the first decade covered by the Forest Plan.

Table C-4. Estimated Silvicultural Treatments (Annual Average Treatment Acres and Volume) in the First Decade on Lands Suitable for Timber Production, based on 3,000 acres of regeneration per year.

Silvicultural Treatment	Acres	Approximate Volume MMCF	Approximate Volume MMBF
Clearcutting	90	2.4	12.0
Shelterwood	2,860	49.6	248.0
Uneven-age	50	0.9	4.5
Commercial Thinning	400	2.4	12.0
Reforestation	2,890	n/a	n/a
Timber Stand Improvement	1,200	n/a	n/a

The volume proposed for harvest must be compared to the long-term sustained-yield capacity (LTSYC) calculated for the GWNF. The LTSYC is defined [36 CFR 219.3] as "the highest uniform wood yield from lands being managed for timber production that may be sustained under a specified management intensity consistent with multiple-use objectives." LTSYC is the potential average growth (mean increment) of the forest on acres allocated to timber production after the stand has reached a managed stand structure. It can be thought of as steady state timber output after the existing stands have been cut and each acre allocated to timber production has settled into a particular management intensity and rotation age. NFMA regulations require: "each sale schedule shall provide for a forest structure that will enable perpetual timber harvest which meets the principle of sustained yield and multiple-use objectives of the alternative." The LTSYC is calculated as 64 MMCF per decade, which is higher than the timber sale program of 55.3 MMCF per decade.

Vegetation Management Requirements at the Project Level

This plan makes the general determination about GWNF lands that are suitable timber production. Final decisions about a proposed project that involves timber harvest are made at the project level. In making this determination, the following factors must be evaluated at the project level and documented in the project or case file (Reference FSH 1909.12, Chapter 61):

- A determination must be made that the project will not cause irreversible damage to resources such as soil productivity or watershed condition;
- The area can be adequately re-stocked according to the Forest Plan's objectives for achieving desired conditions;
- In the case of regeneration harvest, stands should generally have reached culmination of mean annual increment (CMAI).

VEGETATION MANAGEMENT PRACTICES

This section evaluates the usefulness of various vegetation management practices, with a major focus on silvicultural systems used to manage vegetation in management prescriptions suitable for timber production. This Appendix recommends practices that meet NFMA regulations for manipulating vegetation to regenerate stands to desirable native species, usually of the pre-harvest forest type. This Appendix was prepared for compliance with 36 CFR 219.

SILVICULTURAL SYSTEMS

There are three silvicultural systems used to provide regulated and sustainable yield of wood products for local wood processing facilities on the GWNF.

The EVEN-AGED SILVICULTURAL SYSTEM is a planned sequence of treatments for tending, harvesting and re-establishing a stand designed to maintain trees composed of a single age class in which the range of tree ages is usually 20% of rotation. This system creates a mosaic of single age class stands across the forestlands

suitable for producing forest products, where collectively, on the suitable forest land, all aged classes are present and maintained. When the stand reaches the desired product objective, usually expressed as the rotation (the time frame for growing the product objective for a given set of environmental conditions), but may also be expressed as specific wood product(s). Harvesting is scheduled to remove all or most all of the merchantable trees (from which the desired wood products can be produced) in a stand. Whether all or some of the merchantable trees are harvested is dependent upon the regeneration method chosen to accomplish the management prescription objectives. Regeneration, designed to replace desirable tree species, takes place within 5 years after the final harvest.

The TWO-AGED SILVICULTURAL SYSTEM is a planned sequence of treatments for tending, harvesting and re-establishing a stand and maintaining trees of two distinct age classes. The trees in each distinct age class could have tree ages that span up to 20% of the rotation. This system creates a mosaic of two-age class stands across the forestlands suitable for timber production, where collectively, on the suitable forest land, all aged classes are present and maintained. When one age class of the stand reaches the desired product objective, usually expressed as a rotation, harvesting is scheduled to remove that age class, usually the older age class. In a stand, all merchantable trees (from which wood products can be produced) in the older age class are scheduled for harvest. The resulting stand may be two-aged or tend toward an uneven-aged condition as a consequence of both an extended period of regeneration established and the retention of reserve (green) trees that may represent older age classes. When trees in one of the age classes have reached the desired product objective or rotation, that part of the stand is harvested. This harvest regenerates a new age class of desirable tree species to perpetuate the two-aged stand structure within 5 years of the removal of an age class.

The UNEVEN-AGED SILVICULTURAL SYSTEM is a planned sequence of treatments for tending, harvesting and re-establishing a stand and maintaining trees in three or more age classes. Because this system creates a multi-aged stand structure, rotations are not applicable as a management tool. Instead, periodic inventories of the multi-aged stands provide information about the site's productivity, the species present, their size and growth. From this inventory information, product objectives can be determined, as well as the period of time it takes to grow a marketable volume on a sustainable basis. This time frame is used to determine a cutting cycle for producing periodic yields of desired wood products. Additionally, the periodic inventory provides information about the distribution of age classes in the uneven-aged stand. This distribution information is used to plan needed stand improvement practices that adjust the number of trees in each age class to a desired distribution, thus permitting the sustainable production of the product objective. Trees selected for harvest can be dispersed individual trees (i.e., single tree selection) or small groups of trees (i.e., group selection). The system generally maintains a continuous high forest cover across the land while providing a sustained yield of forest products and the orderly growth and development of desired trees with a variety of diameter and ages.

BASIS FOR ALLOCATION OF SILVICULTURAL SYSTEMS

The selection of which silvicultural system and regeneration method to use is based on the existing forest/stand's condition and the desired condition of the management prescription area of which the stand is a part.

During the period from about 1880 through 1930, much of the lands now managed as the GWNF were logged and sometimes burned or badly eroded. Some of the Forest was created from abandoned farmland. Today, these lands have healed and been rejuvenated as a result of Federal investment in tree planting, fire suppression, timber stand improvement, and time. The resultant growth of predominately upland oak, cove hardwood, white pine-hemlock, and southern yellow pine forests consist of essentially even-aged stands, although the chestnut blight of the 1930s created many two-aged stands as well. Since becoming National Forest System lands, some stands have been managed for wood production.

The National Forest Management Act and its Federal Regulations require the identification of forest lands to be used for producing sustainable yields of wood products, thus the need to identify (1) which lands and (2) which silvicultural systems are to be used. Although conceptually possible, the random application of mixing uneven-aged, two-aged, and even-aged stands is not practical over the present predominately even-aged forest. Even though the production of wood products is an objective, equally important objectives are wildlife habitats, water quality and aesthetics. Even-aged, two-aged and uneven-aged management practices each create

different vegetation conditions and stand structures, and have different practices and objectives which have limitations when protecting the forest resources is of primary concern. Likewise each species of tree has unique requirements insofar as light levels, site productivity, and soil moisture in order to regenerate adequately and grow to maturity. Thus, the silvicultural system chosen must also consider the needs of the desirable tree species occupying the site or the species we wish to regenerate. This Revised Plan operates under the principle of management prescription areas, where portions of the Forest have similar environmental conditions, management emphasis and/or specific multiple resource objectives. Therefore, uneven-aged, two-aged and even-aged silvicultural system's practices will not be applied individually to intersperse the silvicultural systems, but rather to portions of management prescription areas where they simultaneously contribute to accomplishing other renewable resource objectives and are appropriate for the desirable tree species to be regenerated or tended.

The initial uneven-aged silvicultural system screening criteria included areas of tentatively suitable forest land that had:

- at least a stand of 100 acres to provide a sufficient total volume harvested in any single entry to allow for an economically viable sale
- slopes from 0% to 20% to minimize the potential damage to the soil and water resource due to the greater number of temporary roads, skid roads, and skid trails required to implement uneven-aged management, as well as to facilitate the economic viability of the timber sale; and
- existing system roads in place for the same reasons identified above.

Uneven-aged regeneration methods are also allowed on lands that do not meet the above criteria when site-specific project objectives include canopy gap creation, scenic enhancement, or restoration/enhancement of old growth forest conditions. Note that frequent entries to maintain an uneven-aged condition in these situations may not be practical due to physical and/or economic limitations.

When using uneven-aged silvicultural system for a given vegetation community, frequent entries are planned into the same area, usually 5-20 year cutting cycles (cutting cycle lengths are a function site productivity for the desired species). Since, on a given harvest entry, only a small portion of a stand's tree density is harvested, the cutting cycles generally result in lower per acre volumes and possible lower total volume, thus reducing the total stumpage value for the harvested products (timber sale revenues are returned to the U.S. Treasury). Rubber-tired skidders are the predominant equipment used on the NFS lands and are capable of skidding the longer distances necessary with the lower marked volume and value removed per acre as compared to even-aged and two-aged silvicultural systems. The repeated exposure of mineral soil every 5 to 20 years as the skid trails are reused is a concern. However, with limiting uneven-aged silvicultural systems to terrain under 20%, a more dispersed skidding pattern can be prescribed, avoiding much of the exposure of mineral soil than would occur on steeper terrain over 20% slope. The visual impact of the bladed skid trails on the ground would be less on the gentler slopes.

In a given entry, the uneven-aged silvicultural system removes a small number of stand's total trees. On slopes over 20%, the maneuverability of a rubber-tired skidder is reduced. This reduced maneuverability—where unmarked trees are to be left undamaged—greatly increases the physical damage to those trees. On gentle slopes, equipment mobility is less restricted, thus less damage occurs to residual trees. Additionally, the less damage means less agents that cause rot being introduced through bole damage, resulting in reduced future yields and value from the stand.

The uneven-aged silvicultural system requires road access over a larger area than even-aged or two-aged management to harvest an equal volume during each entry. These roads have to be constructed (where existing access is lacking) at the first entry and then reopened during each subsequent entry at a 5 to 20 year cutting cycle. Selecting areas where most of the roads are already in place reduces the need for new roads. In most cases where access exists, only dispersed skid trails and some landings are needed.

The final criterion was to provide an efficient means of regulating a sustained yield of forest products from areas where uneven-aged silvicultural system would be applied. This meant determining where land meeting

the other criteria could be consolidated into large, contiguous areas. Even with the 100-acre minimum size constraint, the analysis revealed a large number of interspersed potential areas throughout the Forest. When the smaller scattered parcels were eliminated, the remaining lands could be allocated to several large, contiguous areas of the Forest, thereby providing for the application of cost effective uneven-aged silvicultural system.

On all other suitable land, where uneven-aged silvicultural system criteria are not applicable uneven-aged systems are not considered viable. Vegetation management is limited to two-aged and even-aged silvicultural system on these lands except where stated above where canopy gaps, scenic enhancement, or restoration is the purpose and need of the site-specific project.

REGENERATION METHODS AND STAND IMPROVEMENT PRACTICES

Regeneration methods are the practice by which forest stands of desirable species are established at an adequate stocking level so that they may be sustained for a specific purpose(s), be it the production of wood products, the production of specific habitat for viable wildlife populations, or a combination of both. Depending on the management area emphasis and desired condition, the selected silvicultural system and regeneration method will result in an uneven-aged stand, a two-aged stand, or an even-aged stand. Silvicultural systems are a means of manipulating vegetation to help achieve a management prescription area's desired condition.

Table C-5. Silvicultural Methods within Each of Three Silvicultural Systems

EVEN-AGED stands	TWO-AGED stands	UNEVEN-AGED stands
Regeneration Method:	**Regeneration Method:**	**Regeneration Method:**
1. clearcutting	1. clearcutting with reserves	1. group selection
2. seed tree	2. coppice with reserves	2. single tree selection
3. shelterwood	3. seed tree with reserves	
	4. shelterwood with reserves	
Stand Improvement practices:	**Stand Improvement practices:**	**Stand Improvement practices:**
1. thinning	1. thinning	1. thinning
2. release & weeding	2. release & weeding	2. release & weeding
3. prescribed burning	3. prescribed burning	3. prescribed burning
4. improvement cutting	4. improvement cutting	4. improvement cutting
5. salvage cutting	5. salvage cutting	5. salvage cutting
6. sanitation cutting	6. sanitation cutting	6. sanitation cutting

The Information contained in the following two references provides the scientific explanation for applying silvicultural systems for vegetation manipulation of the forest types on the GWNF.

The Scientific Basis for Silvicultural and Management Decisions in the National Forest System. Russell M. Burns, General Technical Report WO-55, September 1989.

- Silviculture of Northeastern Hardwoods, The Pine Group, pg 21-22, the White Pine forest cover type and the Eastern Hemlock forest cover type
- Silviculture of Southern Pines, Oak-Pine types, pg 34-35
- Silviculture of Eastern Hardwoods, pg 9-17

Silvicultural Systems for the Major Forest Types of the United States. Russell M. Burns, Agriculture Handbook #445-19M.

- Oak-Hickory, pg 116-120 and pg 141-144 (Appalachian Mixed Hardwood)
- Eastern White Pine including Eastern Hemlock, pg 131-134
- Northern Hardwoods, pg 121-127
- Oak-Pine, pg 172-174
- Pitch Pine, pg 135-136

- Yellow Poplar, pg 180-182
- Virginia Pine, pg 167-169

The specific portions of the above listed publications are included by reference and should be read in conjunction with this Appendix to provide comprehensive analysis of vegetation practices applicable to appropriate management areas that allow vegetative manipulation.

Table C-6. Crosswalk of Ecological Systems, Forest Community Types, Eastern Forest Cover Types, and FSVeg Forest Types

Ecological System [2]	Forest Community Type [1]	Eastern Forest Cover Type [3]	Forest Types from the FSVeg Database
Appalachian (Hemlock)-Northern Hardwood Forest (Includes Southern Appalachian Northern Hardwood Forest)	Northern Hardwood Forest	Northern Hardwoods	Black Cherry (70) Black Ash-American Elm-Red Maple (FSVeg 71) Sugar maple-Beech-Yellow birch (FSVeg 81)
Southern and Central Appalachian Cove Forest	Mixed Mesophytic Forest& Conifer-Northern Hardwood Forest	Appalachian Mixed Hardwoods & Yellow Poplar & Eastern White Pine including Eastern Hemlock	White pine (FSVeg 3) White pine-Hemlock (FSVeg 4) Hemlock (FSVeg 5) Hemlock-Hardwood (FSVeg 8) Beech-Magnolia (FSVeg 69) White pine-Cove hardwood (FSVeg 9) Cove hardwood-White pine-Hemlock (FSVeg 41) Yellow poplar (FSVeg 50) Yellow polar-White oak-Red oak (FSVeg 56)
Central Appalachian Floodplain	River Floodplain and Eastern Riverfront Forest	Bottomland Hardwoods	Sweetgum-Yellow poplar (FSVeg 58) River birch-Sycamore (FSVeg 72) Cottonwood (FSVeg 73) Sycamore-Pecan-American elm (FSVeg 75) Undrained Flatwoods (FSVeg 98)
Northeastern Interior Dry-Mesic Oak Forest (includes Southern Appalachian Oak Forest in part and Southern Ridge and Valley/Cumberland Dry Calcareous Forest)	Dry-Mesic Oak Forest	Oak - Hickory	White pine-Upland hardwoods (FSVeg 10) Post oak-Black oak (FSVeg 51) White oak-Red oak-Hickory (FSVeg 53) White oak (FSVeg 54) Northern red oak-Hickory (FSVeg 55) Black walnut (FSVeg 82)
Central and Southern Appalachian Montane Oak Forest (includes Southern Appalachian Oak Forest in part)	Dry and Xeric Oak Forest; Woodland and Savanna	Oak - Hickory	Chestnut oak (FSVeg 52) Scrub oaks (FSVeg 57) Scarlet oak (FSVeg 59) Chestnut oak-Scarlet oak (FSVeg 60)

Ecological System [2]	Forest Community Type [1]	Eastern Forest Cover Type [3]	Forest Types from the FSVeg Database
Southern Appalachian Montane Pine Forest and Woodland (includes Southern Appalachian Low-Elevation Pine Forest)	Xeric Pine & Pine-oak Forest & Woodland	Pitch Pine & Longleaf Pine & Shortleaf Pine & Virginia Pine	Shortleaf pine-oaks (FSVeg 12) Pitch pine-oaks (FSVeg 15) Virginia pine-oaks (FSVeg 16) Table Mountain pine-Hardwoods (FSVeg 20) Loblolly Pine-hardwood (FSVeg 31) Shortleaf pine (FSVeg 32) Virginia pine (FSVeg 33) Eastern red cedar (FSVeg 35) Pitch pine (FSVeg 38) Table Mountain pine (FSVeg 39) Black locust (FSVeg 88)
Central Appalachian Dry Oak-Pine	Dry and Dry-Mesic Oak-Pine Forest	Oak-Pine	Upland hardwoods-white pine (FSVeg 42) Chestnut oak-Scarlet oak-Yellow pine (FSVeg 45) Bottomland hardwoods-Yellow pine (FSVeg 46) White oak-Black oak-Yellow pine (FSVeg 47) Northern red oak-Hickory-Yellow pine (FSVeg 48) Bear oak- southern scrub oaks-yellow pine (FSVeg 49)
Central & Southern Appalachian Spruce-Fir Forest	Montane Spruce-fir Forest	Eastern Spruce - Fir	Red Pine (FSVeg 2) Fraser fir (FSVeg 6) Red spruce-Fraser fir (FSVeg 7) Red spruce-Northern hardwood (FSVeg 17)

1 - per *Guidance for Conserving and Restoring Old Growth Forest Communities on National Forests in the Southern Region*.
2 - per *Chapter 3 of the GWNF Land and Resource Management Plan Draft Environmental Impact Statement*.
3 - per *Silvicultural Systems for the Major Forest Types of the United States*.

Table C-7 summarizes the range of feasible applications of silvicultural regeneration methods that can be used to manipulate vegetation on land suitable for timber production in the Forest Community Types on the Forest. Any of the following methods can be applied to manipulate vegetation when based on site specific project analysis and disclosure in an environmental analysis document.

Table C-7. Applicability of Silvicultural System for Forest Community Types

Ecological System	Even-Aged Silvicultural System			Uneven-Aged Silvicultural System	
	Clearcut	Seed Tree	Shelter-wood	Group Selection	Single Tree Selection
Appalachian (Hemlock)-Northern Hardwood Forest	RC	NR	RC	RC	RC
Southern and Central Appalachian Cove Forest (White pine)	RC	NR	R	P	P
Southern and Central Appalachian Cove Forest (Hemlock))	NR	NR	R	P	P
Southern and Central Appalachian Cove Forest (Cove Hardwoods)	R	NR	RC	P	NR
Central Appalachian Floodplain	R	NR	RC	P	NR
Northeastern Interior Dry-Mesic Oak Forest	RC	NR	RC	P	NR
Central and Southern Appalachian Montane Oak Forest	RC	NR	RC	P	NR
Southern Appalachian Montane Pine Forest and Woodland	R	RC	NR	NR	NR
Central Appalachian Dry Oak-Pine	RC	RC	RC	P	NR
Central & Southern Appalachian Spruce-Fir Forest	NR	NR	RC	P	R

Ecological System	Two-Aged Silvicultural System			
	Clearcut w/ Reserves	Seed Tree w/ Reserves	Coppice w/ Reserves	Shelterwood w/ Reserves
Appalachian (Hemlock)-Northern Hardwood Forest	RC	NR	RC	RC
Southern and Central Appalachian Cove Forest (White Pine)	RC	NR	NR	R
Southern and Central Appalachian Cove Forest (Hemlock)	NR	NR	NR	RC
Southern and Central Appalachian Cove Forest (Cove Hardwoods	R	NR	R	RC
Central Appalachian Floodplain	R	NR	R	RC
Northeastern Interior Dry-Mesic Oak Forest	RC	NR	R	RC
Central and Southern Appalachian Montane Oak Forest	RC	NR	RC	RC
Southern Appalachian Montane Pine Forest and Woodland	RC	RC	NR	NR
Central Appalachian Dry Oak-Pine	RC	RC	RC	RC
Central & Southern Appalachian Spruce-Fir Forest	NR	NR	NR	RC

Codes Used in Table C-7: Range of Regeneration Methods
R = recommended
RC = recommended with conditions
P = possible
NR = not recommended

RECOMMENDED (R) means that the silvicultural regeneration method has been reliable in creating conditions favorable for establishing regeneration of the desired species and to maintain growth of the desirable species using natural regeneration site preparation treatments.

RECOMMENDED WITH CONDITIONS (RC) means that for the silvicultural regeneration method to be reliable, some specific condition must either exist prior to cutting, some limits will apply to the regenerated species, or some special treatment is needed after cutting to obtain and maintain desirable species.

POSSIBLE (P) means the silvicultural practice is not reliable in creating conditions favorable for regenerating the desired species, unless significant alteration of the species composition, growth or sustainability is

acceptable. For example, using single tree selection in the Oak-Hickory type will not perpetuate oaks or other intolerant species in the same proportion as currently exists in the even-aged forest stands of the Forest. If the loss of oaks and the shift to a forest of more shade tolerant species is compatible with the Desired Future Condition of any management area, then single tree selection is a possible silvicultural practice.

NOT RECOMMENDED (NR) means the silvicultural system is not reliable in creating conditions favorable for establishing desired regeneration and to maintain growth of the desirable species using standard or special treatments.

Justification for Codes Selected In Silvicultural Practices Table

The following summarizes the information presented in the two cited references.

- For NR- not recommended, the reason for not recommending the method of cut.
- For RC- recommended with conditions, the specific condition necessary that allows the method of cut to be recommended.
- For P- possible, the likely alteration in species composition, growth or sustainability if the method of cut is applied.

Tables C-8 through C-15 display the justification for the range of silvicultural regeneration methods disclosed in Table C-7.

Table C-8. Even Aged Silvicultural System Justification for Not Recommended (NR)

Ecological System	Regeneration Method	Reason for Not Recommending
Appalachian (Hemlock)-Northern Hardwood Forest	Seed Tree	Natural seeding ability produces sufficient seedlings for adequate advance reproduction; density of seed trees is not sufficient to affect proportion of tolerant/intolerant species. Risk of windthrow of residual stems.
Southern and Central Appalachian Cove Forest (All)	Seed Tree	Risk of windthrow and not necessary since there is plentiful seed present on the site or will be blown in from adjacent stands. White pine seed crops only occur infrequently on a 3-10 year cycle.
Southern and Central Appalachian Cove Forest (Hemlock)	Clearcut	Too much sunlight and dry conditions for seedling development.
Central Appalachian Floodplain	Seed Tree	Risk of windthrow and not necessary since there is plentiful seed present on the site or will be blown in from adjacent stands.
Northeastern Interior Dry-Mesic Oak Forest	Seed Tree	Heavy seed is poorly distributed and slow growing seedlings are not able to compete with other vegetation; light seeded species have abundant seed on the site or available nearby.
Central and Southern Appalachian Montane Oak Forest	Seed Tree	Heavy seed is poorly distributed and slow growing seedlings are not able to compete with other vegetation; light seeded species have abundant seed on the site or available nearby.
Southern Appalachian Montane Pine Forest and Woodland	Shelterwood	Does not provide sufficient sunlight to reach forest floor for seed germination and seedling development.
Central & Southern Appalachian Spruce-Fir Forest	Seed Tree	Too much sunlight and dry conditions for seedling development. Risk of windthrow.
	Clearcut	Too much sunlight and dry conditions for seedling development. Risk of windthrow.

Table C-9. Even Aged Silvicultural System Justification for Recommended with Conditions (RC)

Ecological System	Regeneration Method	Conditions for Recommendation
Appalachian (Hemlock)-Northern Hardwood Forest	Clearcut	Size of harvest unit will control proportion of tolerant and intolerant species that regenerate; pre-commercial treatments are needed to achieve the desired species composition. May be too much sunlight and dry conditions for seedling development.
	Shelterwood	Use if adequate advanced regeneration is not established. To regenerate hemlock in old stands and/or drier site, lacking sufficient hemlock advanced reproduction; two or three cuts may be required.
Southern and Central Appalachian Cove Forest (Cove Hardwoods)	Shelterwood	Will remove overstory within five years to prevent severe reduction in height and diameter growth.
Southern and Central Appalachian Cove Forest (White Pine)	Clearcut	To regenerate white pine, Sufficient white pine advanced reproduction exists in the understory.
Central Appalachian Floodplain	Shelterwood	Will remove overstory within five years to prevent severe reduction in height and diameter growth.
Northeastern Interior Dry-Mesic Oak Forest	Shelterwood	Use if adequate advanced regeneration is not established.
	Clearcut	Use if adequate advanced reproduction is present.
Central and Southern Appalachian Montane Oak Forest	Clearcut	Have to use intensive control of hardwood competition after harvest if it is desirable to maintain a pine component
	Shelterwood	Use if adequate advanced regeneration is not established. Have to use intensive control of hardwood competition after harvest if it is desirable to maintain a pine component
Southern Appalachian Montane Pine Forest and Woodland	Seed Tree	Use when non-serotinous cones are present.
Central Appalachian Dry Oak-Pine	Clearcut	Have to use intensive control of hardwood competition after harvest to maintain a pine component.
	Shelterwood	Have to use intensive control of hardwood competition after harvest to maintain a pine component.
	Seed Tree	Have to use intensive control of hardwood competition after harvest to maintain a pine component.
Central & Southern Appalachian Spruce-Fir Forest	Shelterwood	Use if adequate advanced regeneration is not established.

Table C-10. Un-even Aged Silvicultural System Justification for Not Recommended (NR)

Ecological System	Regeneration Method	Reason for Not Recommending
Southern and Central Appalachian Cove Forest (Cove Hardwoods)	Single Tree Selection	Shade intolerant species will not develop satisfactorily under fully stocked stand
Central Appalachian Floodplain	Single Tree Selection	Shade intolerant species will not develop satisfactorily under fully stocked stand
Northeastern Interior Dry-Mesic Oak Forest	Single Tree Selection	Shade intolerant species will not develop satisfactorily under fully stocked stand
Central and Southern Appalachian Montane Oak Forest	Single Tree Selection	Shade intolerant species will not develop satisfactorily under fully stocked stand
Southern Appalachian Montane Pine Forest and Woodland	Single Tree Selection	Shade intolerant species will not develop satisfactorily under fully stocked stand
	Group Selection	Shade intolerant species will not develop satisfactorily; even small openings create too much shade.
	Group Selection	Shade intolerant species will not develop satisfactorily; even small openings create too much shade.
Central Appalachian Dry Oak-Pine	Single Tree Selection	Shade intolerant species will not develop satisfactorily under fully stocked stand

Table C-11. Un-even Aged Silvicultural System Justification for Recommended with Conditions (RC)

Ecological System	Regeneration Method	Conditions for Recommendation
Appalachian (Hemlock)-Northern Hardwood Forest	Single Tree Selection	Use if desirable species are less shade tolerant species and larger openings are required.
	Group Selection	Use if desirable species are shade tolerant species.

Table C-12. Un-even Aged Silvicultural System Justification for Possible (P)

Ecological System	Regeneration Method	Conditions for Recommendation
Southern and Central Appalachian Cove Forest (All)	Group Selection	Species composition will shift to more moderate shade tolerant species.
Southern and Central Appalachian Cove Forest (White Pine))	Single Tree Selection	Species composition will shift to more moderate or exclusively shade tolerant species.
Central Appalachian Floodplain	Group Selection	Species composition will shift to more shade tolerant species.
Northeastern Interior Dry-Mesic Oak Forest	Group Selection	Species composition will shift to more shade tolerant species, oak species would be reduced.
Central and Southern Appalachian Montane Oak Forest	Group Selection	Species composition will shift to more shade tolerant species.
Central Appalachian Dry Oak-Pine	Group Selection	Species composition will shift to more moderate shade tolerant species, oak and yellow pine species would be reduced.
Central & Southern Appalachian Spruce-Fir Forest	Group Selection	Species composition will shift to more moderate shade tolerant species, spruce and fir may be outcompeted.

Table C-13. Two Aged Silvicultural System Justification for Not Recommended (NR)

Ecological System	Regeneration Method	Reason for Not Recommending
Appalachian (Hemlock)-Northern Hardwood Forest	Seed Tree w/ Reserves	Natural seeding ability produces sufficient seedlings for adequate advance reproduction; density of reserve trees is not sufficient to affect proportion of tolerant / intolerant species. Risk of windthrow of residual stems.
Southern and Central Appalachian Cove Forest (All)	Seed Tree w/ Reserves	Risk of windthrow and plentiful seed Is present on the site or will be blown in from adjacent stands. For white pine, Good seed crops only occur infrequently on a 3-10 year cycle; reserve trees subject to windfall
Southern and Central Appalachian Cove Forest (Hemlock)	Clearcut w/ Reserves	Too much sunlight and dry conditions for seedling development.
Southern and Central Appalachian Cove Forest (White Pine)	Coppice w/ Reserves	Pines rarely if ever stump sprout.
Southern and Central Appalachian Cove Forest (Hemlock)	Coppice w/ Reserves	Too much sunlight and dry conditions for seedling development. Conifers rarely if ever stump sprout.
Central Appalachian Floodplain	Seed Tree w/ Reserves	Risk of windthrow and plentiful seed Is present on the site or will be blown in from adjacent stands.
Northeastern Interior Dry-Mesic Oak Forest	Seed Tree w/ Reserves	Heavy seed is poorly distributed and slow growing seedlings are not able to compete with other vegetation; light seeded species have abundant seed on the site or available nearby.
Central and Southern Appalachian Montane Oak Forest	Seed Tree w/ Reserves	Heavy seed is poorly distributed and slow growing seedlings are not able to compete with other vegetation; light seeded species have abundant seed on the site or available.
Southern Appalachian Montane Pine Forest and Woodland	Coppice w/ Reserves	Pines rarely if ever stump sprout.
	Shelterwood w/ Reserves	Does not provide sufficient sunlight to reach forest floor for seed germination, seedling development, and sapling growth.
	Shelterwood w/ Reserves	Does not provide sufficient sunlight to reach forest floor for seed germination, seedling development, and sapling growth.
Central & Southern Appalachian Spruce-Fir Forest	Clearcut w/ Reserves	Too much sunlight and dry conditions for seedling Development. Risk of windthrow.
	Seed Tree w/ Reserves	Too much sunlight and dry conditions for seedling Development. Risk of windthrow.
	Coppice w/ Reserves	Conifers rarely if ever stump sprout.

Table C-14. Two Aged Silvicultural System Justification for Recommended with Conditions (RC)

Ecological System	Regeneration Method	Conditions for Recommendation
Appalachian (Hemlock)-Northern Hardwood Forest	Shelterwood w/ Reserves	Use if adequate advanced reproduction is lacking
	Coppice w/ Reserves	Size of harvest unit will control proportion of tolerant and intolerant species that regenerate; pre-commercial treatments are needed to achieve the desired species composition.
	Clearcut w/ Reserves	Use if adequate advanced reproduction is present.
Southern and Central Appalachian Cove Forest (Cove Hardwoods)	Shelterwood w/ Reserves	Will remove portion of overstory within five years to prevent severe reduction in height and diameter growth
Southern and Central Appalachian Cove Forest (Hemlock)	Shelterwood w/ Reserves	To regenerate hemlock in old stands and/or drier site, lacking sufficient hemlock advanced reproduction; two or three cuts may be required.
Central Appalachian Floodplain	Shelterwood w/ Reserves	Will remove portion of overstory within five years to prevent severe reduction in height and diameter growth
Northeastern Interior Dry-Mesic Oak Forest	Shelterwood w/ Reserves	Use if adequate advanced reproduction is present
	Clearcut w/ Reserves	Use if adequate advanced reproduction is present
Central and Southern Appalachian Montane Oak Forest	Shelterwood w/ Reserves	Use if adequate advanced reproduction is present. Have to use intensive control of hardwood competition after harvest if it is desirable to maintain a pine component
	Clearcut w/ Reserves	Use if adequate advanced reproduction is present. Have to use intensive control of hardwood competition after harvest if it is desirable to maintain a pine component
	Seed Tree w/ Reserves	Use if adequate advanced reproduction is present. Have to use intensive control of hardwood competition after harvest if it is desirable to maintain a pine component
Southern Appalachian Montane Pine Forest and Woodland	Clearcut w/ Reserves	Use when non-serotinous cones are present.
	Seed Tree w/ Reserves	Use when non-serotinous cones are present.
	Seed Tree w/ Reserves	Use when non-serotinous cones are present.
Central Appalachian Dry Oak-Pine	Clearcut w/ Reserves	Have to use intensive control of hardwood competition after harvest if it is desirable to maintain a conifer component
	Seed Tree w/ Reserves	Have to use intensive control of hardwood competition after harvest if it is desirable to maintain a conifer component
	Shelterwood w/ Reserves	Have to use intensive control of hardwood competition after harvest if it is desirable to maintain a conifer component
	Coppice w/ Reserves	Have to use intensive control of hardwood competition after harvest if it is desirable to maintain a conifer component
Central & Southern Appalachian Spruce-Fir Forest	Shelterwood w/ Reserves	Use if adequate advanced reproduction is lacking.

APPENDIX D: PRIORITY WATERSHEDS

Table D-1. List of Priority Watersheds

Watershed Name	Total Acres	GWNF Acres	% National Forest	T&E, Sensitive, Locally Rare Species	Municipal (PWS)	Brook Trout	303d Biologic at Risk	303d Acid Deposition	303d Recreation	Exceptional Waters	Watershed Condition Class
Laurel Fork-North Fork South Branch Potomac River	40,500	10,523	26%	19		x				x	1
Stony Run-South River	26,852	5,502	20%	7				x	x		2
Canada Run-South River	25,566	9,240	36%	6				x			2
Roaring Run-Craig Creek	11,824	2,053	17%	6							2
Inch Branch-Back Creek	26,609	14,228	53%	4			x	x			2
Mill Creek-Cowpasture River	36,809	22,607	61%	4				x			2*
Pads Creek	16,859	15,339	91%	4							1
Cast Steel Run-Potts Creek	31,384	14,241	45%	4							2
Narrow Passage Creek-North Fork Shenandoah River	39,049	5,185	13%	3	x				x		2
Simpson Creek-Cowpasture River	31,603	19,951	63%	4						x	1
Scotchtown Draft-Cowpasture River	22,287	10,570	47%	3							2*
Thompson Creek-Cowpasture River	21,332	8,858	42%	3							2*
Hays Creek-Potts Creek	13,022	6,412	49%	3							2
Trout Run	30,225	21,980	73%	3						x	2
Lynchburg Reservoir-Pedlar River	21,837	13,075	60%	1	x					x	2

Watershed Name	Total Acres	GWNF Acres	% National Forest	T&E, Sensitive, Locally Rare Species	Municipal (PWS)	Brook Trout	303d Biologic at Risk	303d Acid Deposition	303d Recreation	Exceptional Waters	Watershed Condition Class
Paddy Run-Cedar Creek	26,273	17,137	65%	1	x		x				2
Black Run-Dry River	21,837	20,263	93%	1	X	x		x			2
Indian Draft-Jackson River	19,519	5,484	28%	1	x						1
Smith Creek-Jackson River	21,744	14,045	65%	1	x						2
Browns Creek-Pedlar River	21,937	11,490	52%	2	x				x		2
Bennetts Run-Maury River	27,966	12,140	43%	2		x					1
Capon Run-North Fork Shenandoah River	31,060	16,884	54%	1		x	x			x	2
Cub Creek-Tye River	24,488	7,683	31%	2		x					1
Skidmore Fork-Dry River	24,884	21,085	85%		x	x	x	x			2
North Fork Buffalo River-Buffalo River	28,800	8,175	28%	1		x				x	1
South Fork Tye River-North Fork Tye River	19,991	5,560	28%	1		x					1
Little Dry River	20,128	15,771	78%			x		x	x		2
Little Piney River-Piney River	30,537	15,418	50%			x					2
Poague Run-Maury River	15,639	3,566	23%			x					1
Hawes Run-South Fork South Branch Potomac River	21,094	10,015	47%	1			x			x	2
Riles Run-Stony Creek	33,154	12,669	38%	2			x	x	x		2
Mill Branch-Potts Creek	37,479	8,643	23%	2			x		x		2

Watershed Name	Total Acres	GWNF Acres	% National Forest	T&E, Sensitive, Locally Rare Species	Municipal (PWS)	Brook Trout	303d Biologic at Risk	303d Acid Deposition	303d Recreation	Exceptional Waters	Watershed Condition Class
Miller Run-South Fork South Branch Potomac River	17,902	7,402	41%				x				2
Skidmore Fork-North River	25,342	25,244	100%		x			x		x	2
Saint Mary's River	10,084	9,187	91%	2				x			1
Cabin Creek-Mill Creek	29,042	12,798	44%	2					x		2
Tumbling Run-North Fork Shenandoah River	23,079	671	3%	1	x						Not assessed
Duck Run-Cedar Creek	18,408	1,776	10%	1	x						1
Molly Booth Run-North Fork Shenandoah River	11,908	495	4%	1	x						Not assessed

All watersheds with three or more Federally threatened or endangered, Forest Service sensitive, or locally rare aquatic or riparian species were selected as priority.
"Brook Trout" refers to watersheds with intact brook trout populations, based on the Eastern Brook Trout Joint Venture analysis. All intact brook trout watersheds were selected as priority.
"303d" refers to water quality impairments on Forest Service land, as determined by the state, in accordance with Section 303d of the Clean Water Act. All watersheds with303d impairments that indicate a risk to biological resources were selected as priority.
For the above three criteria, however, no watersheds with less than 2% Forest Service ownership were considered.
"Municipal" refers to Public Water Supplies (PWS), as designated in the Virginia State Water Quality Standards. All PWS watersheds were selected as priority.
Designations/assessments in the remaining columns were of secondary consideration in priority watershed selection:

- 303d impairments resulting from acid deposition.
- 303d impairments for which the water quality does not support water-contact recreation (generally cause by the presence of bacteria in the water).
- Exceptional waters, as designated by the states, in accordance with the Antidegradation Policy of the Clean Water Act.

Watershed Condition Class: In the Forest Service's Watershed Condition Framework process, all watersheds with at least 5% Forest Service ownership were assessed and placed in one of three Condition Classes: Class 1 – Functioning Properly; Class 2 – Functioning at Risk; and Class 3 – Impaired Function. All watersheds on the George Washington National Forest are in Class 1 or Class 2. *Denotes 2011 Watershed Condition Framework Priority Watershed.

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APPENDIX E: SUMMARY OF THE ANALYSIS OF THE MANAGEMENT SITUATION

The Analysis of the Management Situation (AMS) is a determination of a forest's ability to supply goods and services in response to society's demands [36 CFR 219.12(e)]. The AMS for the Forest began with a review of the significant issues in the 1993 Forest Plan and then included new issues that have developed to identify need for change items. The AMS also included analyses of the supply and demand conditions for recreation, timber and minerals and examined benchmarks for defining several maximum and minimum ranges within which alternatives could be constructed. Supply and demand for rangelands was not done due to the small range program on the Forest. The AMS provided a beginning basis for determining the need for change in the existing Forest Plan direction and formulating a broad range of reasonable alternatives. As the development of the Plan progressed through evaluation of the alternatives and additional public involvement, not all of the conclusions or recommendations from the AMS were incorporated in the Plan. The following is a brief summary of the Analysis of the Management Situation, including demand and supply conditions for several resource commodities [36 CFR 219.11(a)] and a description of the benchmarks used to frame alternative development [36 CFR 219.12(e)].

NEED FOR CHANGE IDENTIFIED IN THE AMS

Fragmentation (Successional Habitat). The large unfragmented blocks identified in the 1993 Plan should continue to have desired conditions emphasizing mature vegetation and late successional stages. However, because of greater understanding of the habitat needs for many different species, this desired condition should be expanded to include the need for forest structural diversity, including restoration of more open canopy, late successional stages. This is largely developed through the reestablishment of a historic fire regime that has been suppressed since federal ownership. There is also a need to maintain desired conditions for early successional habitat distributed throughout much of the Forest. To improve progress towards the desired condition for early successional habitat, objectives for prescribed fire should be identified in addition to timber harvest objectives.

Old Growth. The George Washington NF is largely an aging Forest. The acres of Forest that meet the definition of old growth, as defined by southern region guidelines for old growth management, increased from 154,000 to 253,000 between 1993 and 2008. During the next fifteen years, the old growth community is expected to increase another 130,000 acres. Combined with future old growth that will develop in wilderness, backcountry recreation areas and special biological areas, it is expected that old growth will be well distributed in a network of small, medium and large blocks across the Forest. We should formally adopt the southern region guidelines, to be compatible with the other Forests and make all Old Growth Forest Types, except types 21 (Dry-Mesic Oak Forests) and 25 (Dry & Dry-Mesic Oak-Pine Forests), unsuitable for timber production. With the large amount of identified old growth found in these two forest types and the amount of future old growth anticipated in the next planning period, the need for diversity of age and structure within these two forest types to meet habitat needs is more important than the need for additional acres of old-aged stands. All candidate stands for harvest should be inventoried for their old growth characteristics before making a decision to harvest.

Riparian Areas. Adopt as standards the Jefferson Forest Plan Riparian Corridor and Forestwide Channeled Ephemeral standards (consistent with the Federally Listed Threatened and Endangered Mussel and Fish Conservation Plan developed for both Forests) into the plan and have them applicable across the entire George Washington National Forest. The Plan should acknowledge the importance of beavers as a keystone species in the restoration of riparian ecosystems and develop plan components to enhance their populations.

Management Indicator Species (MIS). Use the following species as MIS for the Plan: beaver; pileated woodpecker, ovenbird, chestnut-sided warbler, acadian flycatcher, eastern towhee, black bear, wild turkey, white-tailed deer, hooded warbler, scarlet tanager, pine warbler, wild brook trout, and Cow Knob salamander. This allows greater consistency with MIS chosen for the Jefferson National Forest Plan, as well as other Appalachian Forest Plans.

Threatened, Endangered, and Sensitive (TES) Species. Create new Special Biological Areas to protect the shale barren rockcress, smooth coneflower, Virginia sneezeweed, and the Northeastern bulrush. Delineate the Primary and Secondary Cave Protection areas (as shown in the Forest's 1998 Indiana Bat Amendment) and correspondingly, adopt the Jefferson Forest Plan direction for these areas.

Special Biological Areas. Adopt the proposed new areas and expansions to existing Special Biological Areas.

Ecosystem Management/Ecological Restoration. Add a new Desired Condition regarding American chestnut recovery. Add plan components addressing the following: improving the quality of unhealthy stream systems within unhealthy watersheds; maintenance or enhancement of native ecosystems; restoration of fire-dependent ecosystems; restoration of structural and species diversity in forest systems; treating non-native invasive species; aquatic organism passage; and maintenance or enhancement beaver populations on the Forest.

Fire. Define and identify fire's role, including prescribed fire and wildfire, in the ecosystem. Acknowledge that some of the Forest will be suitable for the use of wildfire to restore and maintain desired ecological conditions and that safety of firefighters and the general public and the protection of life and property are the highest priorities. Define the values to be protected from and/or enhanced by managing wildfire. Increase the objective for planned prescribed fire to meet restoration and maintenance needs for threatened, endangered, sensitive, and locally rare species, the yellow pine community and other vegetative communities across the Forest.

Groundwater, Caves and Karst. Include desired conditions and standards and guidelines to protect karst areas and caves, including the areas identified by the Commonwealth of Virginia.

Forest Pests and Invasive Species. Develop a Forest strategy for managing non-native invasive species (NNIS) including a Forestwide Desired Condition and objectives for treating NNIS on the GWNF. This strategy should address prevention of infestations, control of existing infestations, public education, identification of non-native invasive species, inventory protocols, and treatment methods.

Lands Suitable for Timber Production. Strive to maintain at least the existing amount of forest suitable for timber production between 350,000 to 370,000 acres to provide for wildlife habitat, forest health, and local community economic needs.

Salvage. The recent increase in gypsy moth activity has revived the need to consider salvage harvest guidance. Include desired conditions and standards that allow salvage.

System Roads across the Forest. It does not appear that there is a need for an objective for increasing permanent road construction. Old unauthorized roads continue to be identified and other roads are identified that no longer meet access needs. Taking into consideration the issues identified, the benefits and risks analyzed and the recommendations for a minimum road system contained in the 2010 Transportation Analysis Process, there should be an objective to decommission roads.

Licensed Off-Highway Vehicle (OHV) Use. Should not provide designated OHV routes or areas in the Forest Plan. The roads and trails open or seasonally open to OHVs can change due to resource conditions and management objectives and the locations of open roads are included on the Motor Vehicle Use Maps, which are periodically updated.

Existing Inventoried Roadless Areas. The portions of the areas that were managed as Remote Highlands in the 1993 Forest Plan should be identified as remote backcountry areas. These should continue to be managed as unsuitable for timber production and with a prohibition for road construction (with limited exceptions). The use of salvage in these areas should be addressed. Many of the remote backcountry recreation areas should be expanded to include the entire Inventoried Roadless Area.

Wilderness. Adopt desired conditions and standards in the revised Plan that allow fire to play its natural ecological role within Wilderness.

Aesthetics. Adopt the Scenery Management System to maintain the high level of emphasis on scenic quality across the Forest and remain current with direction provided in the Agriculture Handbook for Scenery Management.

Federal Minerals. As changes are made in the Forest Plan, we will likely need to update the oil and gas leasing availability. The Revised Plan should continue to offer opportunities to explore and develop federal leasable minerals (energy minerals, such as natural gas, and non-energy minerals) and federal mineral materials while providing integration with, and protection of, surface resources. Furthermore, site-specific analysis on any ground-disturbing mineral activity must still occur.

Private Mineral Rights on Federal Lands. Consider outstanding and reserved mineral rights throughout the planning process. Adopt standards to assure proper review of mineral rights during project implementation.

Wind Energy Development. Identify the following special areas as unsuitable for locating wind energy development (commercial wind farms): Wilderness or wilderness study areas; special botanical, zoological, geological, or research natural areas; Shenandoah Mountain Crest (Cow Knob Salamander Habitat); both Indiana Bat protection areas; Appalachian Trail corridor; remote backcountry areas; Mount Pleasant National Recreation Area; and Big Schloss, Laurel Fork, and Little River Special Areas. Proposals for wind energy development in other areas would be addressed following Agency policies for special use permits and any Agency policy specifically for wind energy development.

Dispersed Recreation. Use the basic Recreation Opportunity Spectrum (ROS) inventory classes. In addition, use the new ROS inventory to help identify remote backcountry areas and evaluate potential wilderness areas. Any potential projects in the future that could affect the current ROS setting will be addressed through site-specific project analysis.

Grazing. Include a desired condition for bottomland hardwood forest as well as pastoral setting (managed through grazing, burning, mowing, or hay fields) and adopt standards similar to those in Jefferson Plan Revision for riparian and soil resource protection, which includes practices recommended by the Natural Resource Conservation Service (NRCS) .

Drinking Water. In the revised plan, identify drinking water supplies that depend on the national forest. Establish guidelines that protect water quality for endangered and threatened aquatic species and drinking water. In the strategy section of the revised Plan, identify the importance of considering downstream uses in determining priorities for watershed improvement activities.

Climate Change. A climate change strategy should be incorporated into the Revised Plan.

SUMMARY OF SUPPLY AND DEMAND CONDITIONS

Range

The range program on the George Washington NF is so small in scope that supply and demand conditions were not considered necessary.

Recreation

The market area for recreation was defined as all counties that fall within a 75-mile straight-line radius from the Forest border. For the George Washington National Forest (GWNF), the market area entails portions of Virginia, West Virginia, Pennsylvania, Maryland and North Carolina. The population living within the market area is about 9 million people. Opportunities for outdoor recreation within the market area are not limited to the GWNF. Within the market area, the U.S. Forest Service offers additional opportunities on the Jefferson and Monongahela National Forests. The National Park Service offers opportunities in Shenandoah National Park,

Blue Ridge Parkway, Harpers Ferry National Historic Park, C&O Canal National Historic Park, multiple historic sites, and the National Capital Region (mall, memorials and historic sites in Washington, DC). All of these areas connect and expand opportunities for recreation on federally managed public lands. The Appalachian National Scenic Trail also provides a unique long distance hiking opportunity north to south across the entire length of the market area. It connects multiple National Forests and Parks as well as State Forests and Parks from northwest Georgia to northwest Maine, with approximately one-fourth of its length being in Virginia.

Currently, there are 59 developed sites managed by the George Washington National Forest to accommodate different recreation activities (Table E-1). The Forest Service defines the capacity of developed recreation sites in terms of "people at one time" that a site can support, called PAOTs.

Table E-1. Current Supply of Day-Use Developed Areas on George Washington NF

Site Type	Number of Sites	Total Capacity (PAOTs)
Motorized Boating Sites*	2	350
Campgrounds & Complexes**	21	6,740
Horse Campgrounds	1	25
Interpretive Sites	10	815
Observation Sites	4	485
Picnic Sites	10	730
Swimming Sites*	7	945
Target Ranges	4	120
Grand Total	59	10,210

Source: INFRA-Recreation Sites Report. INFRA is a Forest Service database that contains all developed recreation sites inventory data.
*Coles Point offers both a swimming area and a boat ramp. The entire capacity of Coles Point is listed with the swimming site.
** All of the level 5 campgrounds and three of the level 4 campgrounds have day lakes with sand swimming beaches. The capacity of these day use areas is included with the Campgrounds & Complexes.

The supply of lower development scale, more primitive facilities provided by the Forest currently exceeds demand. Occupancy is typically low at the majority of the development scale 2 and low 3 recreation sites, with seasonal variability. For most of the lower development scale sites, occupancy increases during spring and fall hunting seasons, but rarely to full capacity at most sites.

At the upper end of the development scale, the public demand for campsites is greater than the demand for lower development scale sites. However, demand rarely exceeds supply, except during the summer holiday weekends. The exception to this is Sherando Lake family campground, which routinely fills to capacity throughout the summer. Across the Forest, demand for campsites with utility hookups exceeds supply. The Forest has not installed additional utility hookups in recent years due to the cost of installation and ongoing maintenance, desires to reduce the carbon footprint, and in keeping with our Forest's recreation niche which is primarily trails and dispersed recreation. State parks and privately owned campgrounds meet some of the public demand for sites with utility hookups and other amenities for visitor comfort. State parks and private sector campgrounds are typically more highly developed than Forest Service campgrounds.

Dispersed recreation is defined as those activities that occur outside of developed recreation sites such as boating, hunting, fishing, hiking and biking. There are 56 developed recreation sites that support dispersed use of the forest such as trailheads, trail shelters and boat ramps. Table E-2 provides a summary of the developed areas used to access dispersed recreation opportunities on the national forest.

Table E-2. Developed Access Points for Dispersed Recreation on the George Washington NF

Site Type	Number of Sites	Total Capacity (PAOTs)
River and Lake Boating Access	9	325
Fishing Sites	7	701
Observation Sites	3	96
Hang Gliding Sites	4	70
Trail Shelters	13	109
Trailheads	20	1,307
Grand Total	56	2,608

The George Washington National Forest offers approximately 1,078 miles of trails. The majority are for non-motorized, multiple uses and are shared by hikers, equestrians and bicyclists. Notable exceptions are the Appalachian National Scenic Trail and several short interpretive trails that are open to hikers only and trails in designated Wilderness where bicycles are prohibited. Also excluded from multiple uses are some trails within developed recreation areas. Approximately 65 miles on three trail systems provide motorized use opportunities. All three trail systems are open to all-terrain vehicles and motorbikes, and one has portions open to off-highway or four-wheel drive trucks.

Table E-3 gives a breakdown of the miles of trail that are managed for various types of uses. The total trail miles do not add up to the total National Forest System Trail miles because of the overlap in uses allowed.

Table E-3. Approximate Miles of Trail Offered on the George Washington NF

Type of Trail	Miles	Comment
Wilderness	68	Total of approximately 1,078 miles
Non-Wilderness	1,010	
Trail miles that allow hikers	1,078	
Trail miles that allow equestrians	811	All except Appalachian Trail, interpretive trails, and trails within developed recreation areas including angler trails
Trail miles that allow bicyclists	794	All except Appalachian Trail, trails in designated Wilderness, interpretive trails and certain trails within developed recreation areas including angler trails
Trail miles that allow ATVs and OHVs	65	Allowed on designated motorized trails only

Demand for long-distance trails for special recreation events, such as long-distance mountain bicycling, equestrian endurance rides and runner marathons, has increased in recent years. The demand is greatest among the equestrian and mountain biking communities. Events are not permitted in designated Wilderness and neither of these user groups is permitted on the Appalachian National Scenic Trail. Concern has been expressed among some in these user groups that any additional Wilderness designations should exclude, to the extent possible, trails that currently are used, or that by their connectivity to other trails could be used, for long-distance trail riding opportunities and special recreation events. There is more demand than supply for motorized trail opportunities.

The ability of the Forest to provide such a significant trails program is largely dependent on the volunteer workforce that helps with maintenance of trails. In fiscal year 2010, volunteers contributed 50,928 hours to the dispersed recreation program, equivalent to 28 full time employees. The motorized trail program relies heavily on grants from the Virginia Recreational Trails Fund program. While support from volunteers and the grant programs have been consistent, a decline in either of these programs will have negative implications for the sustainability of the dispersed recreation program.

Hunting and fishing are traditional and popular dispersed recreational uses of the George Washington National Forest. The Forest Service manages the habitats that sustain populations of small and big game species as well as cold and warm water fisheries. The Virginia Department of Game and Inland Fisheries and the West Virginia Department of Natural Resources stock certain streams and lakes.

The Virginia Department of Conservation and Recreation has been sampling participation rates in outdoor recreation since 1965. According to the *2007 Virginia Outdoors Plan*, the two highest needs for outdoor recreation in the next five years are access to recreational waters of the state and trails close to home. Table E-4 shows the results of the *2006 Virginia Outdoors Survey* (Virginia Outdoors Plan, 2007) with the most popular outdoor recreation activities in Virginia.

Table E-4. Ranking of Outdoor Recreation Activities Based on Percent of Households Participating (Source: 2007 Virginia Outdoors Plan)

Activity	Percent of Population, 2006	Percent of Population, 2002	Percent of Population, 1996
Walking for pleasure	72	67	65
Visiting historic sites	56	40	35
Driving for pleasure	55	62	60
Swimming	44	52	53
Visiting nat. areas, parks	44	27	24
Sunbathing on beach	36	39	42
Fishing	26	42	29
Picnicking	26	29	31
Using a playground	25	24	24
Boating	24	34	31
Jogging	24	22	20
Visiting gardens, arboretums	21	22	20
Bicycling	21	40	31
Camping	18	28	26
Hiking, backpacking	16	18	15
Golf	14	25	20
Basketball	12	15	12
Fitness trail	10	7	6
Soccer	9	9	6
Snow skiing, boarding	9	12	13
Tennis	8	16	20
Hunting	7	14	17

The West Virginia Development Office produced a 2009 Statewide Comprehensive Outdoor Recreation Plan (SCORP) that included a 2008 recreation survey of state residents. Walking, birdwatching, fishing, and hunting activities all ranked above 35%, followed by camping and canoeing at 7%. The SCORP reports that hunting levels and economic returns have remained high compared to other states and national trends.

However, in Virginia, a significant trend in outdoor recreation activities indicated in the *2006 Virginia Outdoor Survey* is the decline in the numbers of hunters in Virginia. In the past 10 years, hunting has decreased from an activity engaged in by 17 percent of households in 1994 to 7 percent of households in 2006. According to the 2007 Virginia Outdoors Plan "the continued change in land use patterns from rural to urban and suburban may have driven this change. Sixty-five percent of hunters in Virginia hunt on private lands. The lack of access to previously hunted private lands due to landowner changes has also driven a change in supply of lands for hunting. In fact, where lands remain rural, hunting participation rates are much higher than in the urban crescent (Northern Virginia). Participation in the mountain region was 21.4 percent, Piedmont region was 16.4 percent and Chesapeake region was 16.5 percent, as contrasted with the participation rates of 6.1 percent in the urban crescent."

Table E-5 provides Forest Service projections in public participation in outdoor recreation activities on the George Washington NF. This list of individual activities or activity composites was derived from the National Survey on Recreation and the Environment and was adjusted for the GWNF.

Table E-5. Fifty Year Projected Activities in Outdoor Recreation on GWNF (number of people, in thousands)

Recreation Activity	2010	2020	2030	2040	2050	2060
Camping						
Developed Camping	105.16	117.44	130.13	140.87	151.81	163.68
Driving						
Driving For Pleasure	47.77	53.38	59.19	64.06	68.98	74.36
Other Motorized Travel	0.83	0.93	1.03	1.12	1.20	1.30
Motorized Water Travel	24.42	27.23	29.74	32.29	35.36	38.78
TOTAL FOR GROUP	73.02	81.55	89.96	97.47	105.54	114.45
Fishing						
Fishing	189.82	208.12	224.94	238.62	253.22	268.93
General						
General Relaxing	74.05	82.75	91.75	99.30	106.93	115.28
Swimming	57.19	64.51	71.78	78.49	85.70	93.63
TOTAL FOR GROUP	131.24	147.27	163.53	177.79	192.63	208.91
Hiking						
Hiking/Walking	210.56	237.34	265.76	291.31	318.09	347.74
Hunting						
Hunting	99.49	104.57	108.09	110.14	112.29	114.34
Nature						
Visiting Nature Centers, VIS	1.23	1.38	1.54	1.69	1.83	1.99
Gathering Berries, Natural Products	10.92	12.31	13.74	15.00	16.31	17.75

Recreation Activity	2010	2020	2030	2040	2050	2060
TOTAL FOR GROUP	12.15	13.69	15.28	16.68	18.14	19.74
Off-Highway Vehicles						
Off-Highway Vehicles	8.34	9.03	9.56	10.15	10.88	11.65
Primitive Camping						
Primitive Camping	5.01	5.52	6.00	6.44	6.91	7.42
Backpacking, Camp in Unroaded Areas	3.34	3.68	4.00	4.29	4.61	4.95
TOTAL FOR GROUP	8.35	9.20	10.01	10.73	11.52	12.36
Picnicking						
Picnicking	7.36	8.22	9.11	9.86	10.63	11.46
Trails						
Bicycling	15.13	17.05	18.88	20.79	22.99	25.46
Horseback Riding	2.52	2.82	3.08	3.37	3.73	4.13
Non-Motorized Water Travel	1.67	1.82	1.93	2.07	2.24	2.42
TOTAL FOR GROUP	19.32	21.69	23.90	26.23	28.96	32.02
Viewing						
Viewing Scenery	117.33	131.12	145.38	157.35	169.43	182.66
Viewing Wildlife, Birds, Fish	72.95	82.47	92.70	100.67	108.36	116.76
TOTAL FOR GROUP	190.28	213.60	238.08	258.02	277.80	299.42
Wilderness						
Wilderness	11.48	12.64	13.75	14.75	15.83	16.99
TOTAL FOR ALL GROUPS	1,066.56	1,184.35	1,302.08	1,402.63	1,507.33	1,621.68

Data Source: Bowker, J. M., and Askew, Ashley (forthcoming). Outdoor Recreation Participation Projections 2010 to 2060. In: Outdoor Recreation Trends and Futures: Technical Document Supporting the Forest Service 2010 RPA Assessment. GTR-SRS-150. Asheville, North Carolina: U.S. Department of Agriculture, Southern Research Station. The data for three projections scenarios were averaged by Paul Arndt, Regional Planner, U.S. Forest Service Southern Region. Omitted from the list are various winter sports, which are not relevant to projections for the Southern Region.

Timber

The market area for timber production on the George Washington NF was defined as a 50 mile radius around the Forest border. This market area includes a total of 64 counties in 3 States (2 counties in Maryland, 41 counties in Virginia, and 21 counties in West Virginia). A total of 19.2 million acres are contained within this market area (.7 million acres in Maryland, 11.5 million acres in Virginia, and 7 million acres in West Virginia). The GWNF comprises approximately 5.5% of the land within the market area.

Information regarding the supply of timber was compiled using the most recent available Forest Inventory and Analysis (FIA) data. The two largest categories of timberland owners in the market area include privately held and National Forest Service (NFS) lands (including the entire George Washington National Forest and then portions of the Jefferson and Monongahela National Forests), accounting for 96% of the timberland in this market area. There are approximately 26.7 Billion Cubic Feet (bcf) of live volume on these timberlands, with

about 9 bcf occurring as sawtimber. Roughly three-quarters of the total volume occurs on private lands while another 20% occurs on National Forest Lands.

However, not all of this 27 bcf of volume within the market area is available as a supply of wood products. Worthington et al. (1996) examined several factors which result in changes to availability of this standing volume; primarily economic consideration and landowner attitudes. Worthington et al. concluded that approximately 67% of the standing volume was economically available based on exhaustive modeling and analysis given market conditions in 1996. Of course markets have changed since that time. Data published by the Appalachian Hardwood Center, an affiliate of West Virginia University, indicates that Red Oak stumpage prices have fallen by 165% since 1996 (red oak is a major component of the hardwood products in this market area and is used as a proxy for all sawtimber for this purpose). Hardwood pulp stumpage increased by 250%, since 1996. When considering that 35% of the standing volume in the market area is sawtimber and 65% is pulp (a vast majority of which is hardwood pulp), these decreases and increases over time balance each other. Overall stumpage prices in this market area are about 104% of the 1996 stumpage prices. Thus, the findings in Worthington et al. can still be used to approximate current market conditions for this broad scale analysis. Therefore it can be estimated that a total of approximately 18 bcf is economically available in the market area; 14 bcf on privately held lands, 3 bcf on National Forest System lands, 1.5 bcf of that on the GWNF, and 1 bcf on other public lands.

Landowner attitudes are a large influence in wood product availability, especially on the private lands that compose a vast majority of this market area. Worthington et al. estimated that about 14% of private landowners reflect a “never harvest” segment of the market. Within the remaining segment, dollar returned was considered the primary factor in wood availability. They further estimated that an additional 41% of the standing volume would not be available because the value returned would not be high enough for the landowner to sell. Thus, a combined reduction of 55% of the volume could be considered unavailable on privately held lands. This means that in general 45% of the economically available volume on private lands would actually be available considering landowner attitudes, equating to approximately 6.3 bcf of total standing volume.

This concept of landowner attitudes can also be extended to public lands. Much of the Other Federal lands in the market area include reserved lands administered by the National Park Service and Fish and Wildlife Service, meaning this volume would also fall into the “never harvest” segment of the market. Similarly, about 32% of the current GWNF (1993 Plan) is considered suitable for timber production. The availability of volume on State and Municipal lands varies widely, but this area is such a very small component of the market area (about 4%), that those lands do not figure heavily in wood product availability in the market area as a whole. For the purposes of this analysis we will estimate that 1 bcf would be available on National Forest System lands and .51 bcf of that on the GWNF, after considering lands unsuitable for timber production. From 0 to 1 bcf is available on all other lands.

Thus, it is estimated that a total standing volume of approximately 7 to 8 bcf would be available as a timber supply on all lands in the market area, equating to a 70% reduction of the total standing live volume in the market area. We can expect this to grow by about 0.57 bcf per year.

Although the scope of this analysis is very broad encompassing some 64 counties in 3 States, we believe it is also important to consider the role of NFS lands on a more local level. National Forest System lands occupy more than 30% of the land base in three of the counties in the market area and a few more counties contain 20-30% NFS lands. Certainly the role that the timber supply from Forest lands play in these local economies can be important and should not be lost or discounted when taking a larger view.

Biomass fuels for the generation of energy are gaining interest and support in many parts of the south. The potential to supply biomass fuels from the GWNF is included in the aforementioned estimates. Of the .51 bcf available as supply, anywhere from 0 to .25 bcf could potentially be utilized as biomass fuel, or a maximum of 8.75 million tons forestwide. The upper bound of this estimate is the small roundwood component usually utilized in paper production plus the traditionally non-merchantable material in branches and tops; we presume that no sawtimber would be utilized as biomass fuels. However, it is important to note that under

current management (1993 Plan) the entire Forest only produces about 70,000 tons of wood, including sawtimber. This puts the almost 9 million ton figure identified as a maximum into perspective; it is probably not realistic.

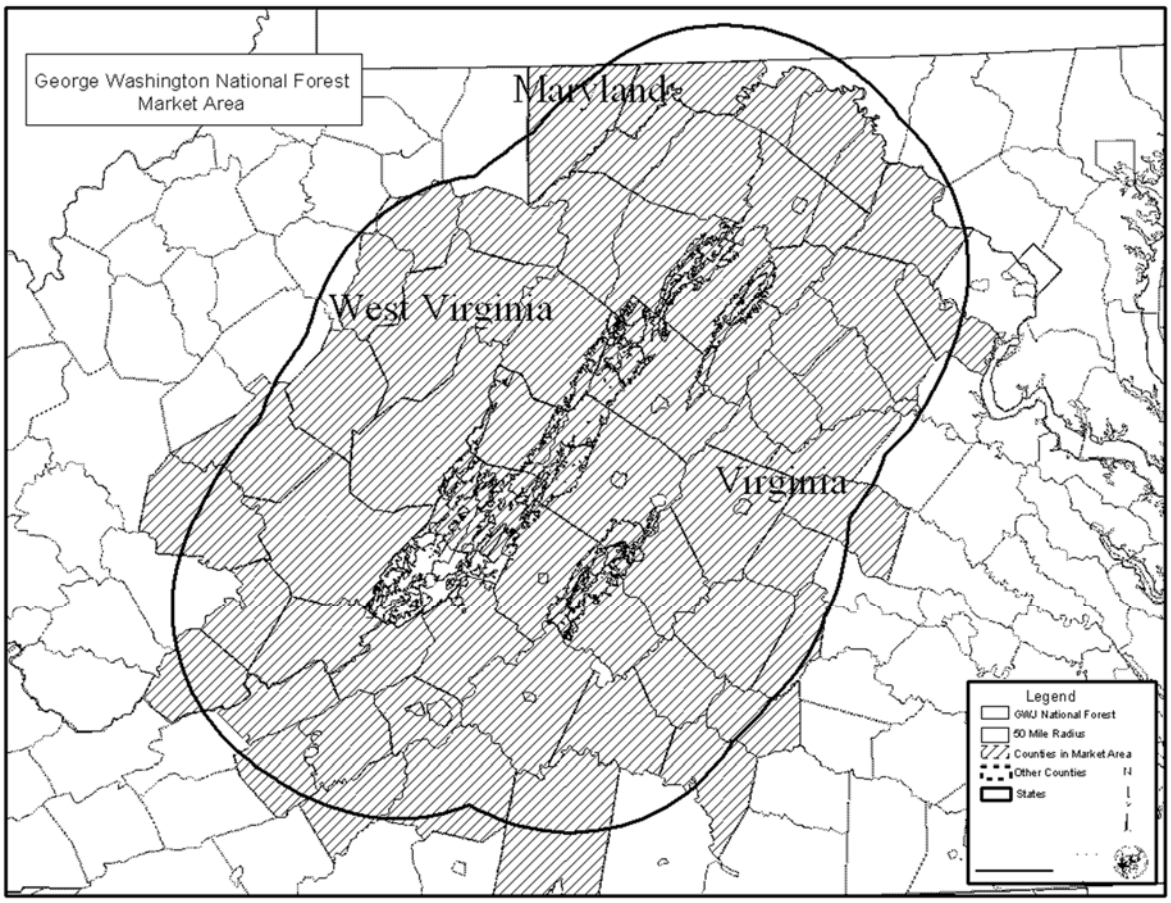

Figure E-1. Market Area for George Washington National Forest Wood Products

Minerals – Federal Leasable Oil and Gas

The federal government owns 100% mineral rights on about 84% of the Forest. Private parties own mineral rights on the remaining 16% of the Forest. As of September 2010, federal oil and gas leases were in effect on about 1% of the Forest (10,243 acres) but there are no active oil and gas wells. Exploration on GWNF lands has been sparse and activity on surrounding lands has been minimal. Thus far, only five wells have been drilled on Forest lands. All were designed to test a specific horizon and all were dry holes. Two small natural gas fields have been developed adjacent to GWNF lands, but, with the exception of one well, there has been no drilling activity since the 1990s.

Several oil and gas plays exist in the area. The most significant of these plays is related to the Marcellus Shale which is present on the surface and in the subsurface under more than half of the GWNF lands. Current industry focus directed toward the exploration for and exploitation of organic shales, and in particular the Marcellus, is high at this time. Development of the Marcellus shale is generally done with horizontal drilling and use of hydraulic fracturing at numerous locations throughout the horizontal bore holes. Marcellus shale-type

development through horizontal drilling has not yet occurred on the Forest. Patchen and Avary (2008) state, "The Middle Devonian Marcellus Shale is the oldest, thickest and most widespread of four formations in the Hamilton Group of central and eastern New York. This black shale unit extends from New York southward to Virginia and West Virginia, and westward into eastern Ohio where it pinches out beneath the Middle Devonian unconformity. In Ohio, the Marcellus Shale generally is not separated from younger rocks in the lower Olentangy Formation; in Virginia, the Marcellus usually is included in the basal portion of the thick Millboro Shale." Enomoto (2009) states, "In the Virginia portion of the Appalachian Basin, the Devonian Mahantango Formation and the Marcellus Shale are mapped collectively as one unit that is named the Millboro Shale. This unit in Virginia consists of black, fissile shale units, with interbeds of dark gray argillaceous limestone or calcareous shale. Thin, dark gray, aphanitic limestone beds occur near the base. Geophysical logs from wells drilled in Highland and Rockingham counties, Virginia, indicate that the thickness of the Millboro Shale ranges from 368 to 570 feet thick in this region." The following table shows the estimated extent of the Marcellus shale formation on the Forest, as it relates to oil and gas leasing considerations.

Table E-6. GWNF Mineral Status and Marcellus Shale

Mineral States	Acres	Percent of GWNF (%)	Marcellus Shale Acres	Percent of Land Status in Marcellus Shale (%)
Total GWNF Acres	1,065,499	100.0%	592,300	55.6%
Withdrawn from mineral leasing by law	50,727	4.8%	22,537	44.4%
Not withdrawn from mineral leasing by law	1,014,772	95.2%	569,763	56.1%
Outstanding or reserved mineral rights - Partial or complete private mineral interest (subtotal of "not withdrawn" acres)	167,206	15.7%	97,615	58.4%
100% federal mineral ownership (subtotal of "not withdrawn" acres)	847,566	79.5%	472,148	55.7%
Existing federal oil & gas leases	10,243	1.0%	10,243	100.0%

Future projections of the kind and amount of oil and gas activity that could be reasonably anticipated began with a Reasonable Foreseeable Development Scenario (RFD) prepared by the Bureau of Land Management (BLM). The RFD is based on the assumption that all lands on the Forest would be available for oil and gas leasing under standard lease terms and conditions, except for those areas withdrawn from leasing by law (Wilderness and National Scenic Area). It covers a time period of 15 years and includes all lands within the boundaries of the George Washington National Forest (GWNF) regardless of mineral estate ownership. Privately owned mineral rights are constitutionally protected property rights and can be exercised at any time. The Forest Plan can identify lands with federal mineral rights as administratively unavailable for federal leasing in addition to those withdrawn by law. Therefore, the RFD can be viewed as the 'maximum' amount of federal oil and gas leasing activity projected.

The RFD estimated that a maximum of 20 vertical exploration/evaluation wells could be drilled over the next 15 years which will prove the presence of productive Marcellus Shale in the area of the GWNF. Additionally, 50 vertical and 249 horizontal development wells could be drilled.

Minerals – Federal Leasable (other than oil and gas)

Historically, iron mining and some coal mining occurred on the Forest. But there is no recent interest in these or other hardrock leasable minerals. Some geothermal leasing occurred on the Forest in the 1980s, but there has been no recent interest in geothermal leasing.

Private Mineral Rights (Reserved and Outstanding Mineral Rights)

Private mineral rights (reserved and outstanding mineral rights) underlie about 16 percent of the Forest. These outstanding or reserved mineral rights (non-federal mineral rights) are partial or complete mineral interests. Reserved rights are those retained in part or in whole by the seller when the federal government acquired the tracts comprising the National Forest. Outstanding rights are mineral rights owned and retained by a third party when federal government acquired the tracts comprising the National Forest. Of the privately-owned mineral rights, about 76 percent are mineral rights outstanding to third parties, and 24 percent are mineral rights reserved by the grantor at the time of acquisition by the federal government.

The only active operation under private mineral rights is a shale mine in operation since the 1980s on the Pedlar Ranger District. Since 1993 reclamation of the previous shale mine has occurred, while additional mining has occurred in recent years. In 2005 the James River Ranger District received a proposal to exercise private mineral rights by mining. Forest Service requested additional information about the proposal, but has not received the information. To date, the proponent has not pursued the proposal with the Forest Service.

BENCHMARK ANALYSIS

Benchmark analysis is specified in the NFMA regulations in 36 CFR 219.12(e) as part of the Analysis of the Management Situation. Benchmarks approximate maximum economic and biological resource production opportunities and are useful in evaluating the compatibilities and conflicts between individual resource objectives and in defining the range within which integrated alternatives can be developed. The following benchmark analyses are consistent with the minimum applicable management requirements of 36 CFR 219.27.

Minimum Level of Management Benchmark 36 CFR 219.12(e)(1)(i). This benchmark represents the minimum level of management needed to maintain and protect the GWNF as part of the National Forest System. This level of management does involve some activities and costs in order to meet the following minimum management requirements:

- Protect the life, health, and safety of incidental users;
- Prevent environmental damage to the land or resources of adjoining lands of other ownerships or downstream users;
- Conserve soil and water resources;
- Prevent significant or permanent impairment of the productivity of the land; and
- Administer unavoidable non-Forest Service special uses and mineral leases, licenses, permits, contracts, and operating plans.

Alternative C in the DEIS embodies most of the elements of a minimum level of management; however some activities are allowed in this alternative to make it a more realistic and viable option. The activities in Alternative C that involve more than a minimum level of management include: the continued operation of three ATV use areas; more of an emphasis on non-motorized recreation that would include an increase in trail miles; and continued operation of some developed recreation sites.

Maximum Physical and Biological Production Potential Benchmarks 36 CFR 219.12(e)(1)(ii). These benchmarks identify the maximum physical and biological production potentials of significant individual goods and services together with associated costs and benefits. For ecological systems, the maximum biological

production is represented by the desired conditions for the cove, spruce, northern hardwood, oak and pine systems in Chapter 2 of the Plan.

Maximum Timber Benchmark. This benchmark is used to identify the maximum timber production potential of the Forest, subject to these specifications:

- The objective function maximizes timber volume in the first five decades, with a rollover to maximize present net value for 15 decades.
- All tentatively suitable acres are included, without any management prescription allocations, so every tentatively suitable acre is eligible for harvest.
- No successional habitat constraints are applied.

Several key results of the maximum timber benchmark are:

- 910,000 tentatively suitable acres are allocated to timber production
- Annual harvest is 19.68 MMCF (98.4 MMBF)
- Annual harvest is 10,331 acres
- Cumulative Present Net Value over five decades is $117,447,000
- Long-term sustained yield is 23.66 MMCF

Maximum Wilderness Benchmark. This benchmark is used to identify the maximum potential of the Forest to provide areas that meet the definition of wilderness according to the 1964 Wilderness Act. In Chapter 2 of the DEIS, Alternative C represents this benchmark, with the recommendation for wilderness study all of the 37 areas in the Potential Wilderness Area inventory as well as Southern Massanutten Mountain and the Friars Inventoried Roadless Areas. This benchmark represents 386,800 acres recommended for wilderness study and 20,000 existing Wilderness acres.

Maximum Natural Gas Production Benchmark. This benchmark is used to identify the maximum potential for the Forest for natural gas production. This benchmark is represented by the Reasonably Foreseeable Development (RFD) prepared by the Bureau of Land Management that is based on the assumption that all lands on the Forest would be available for oil and gas leasing under standard lease terms and conditions, except for those areas withdrawn from leasing by law. The RFD is described in more detail in Chapter 3 of the DEIS. This benchmark represents the construction of 20 vertical exploration/evaluation wells and 50 vertical and 249 horizontal development wells.

Present Net Value Benchmarks – The following benchmarks are described in the 36 CFR 219 regulations.

- 36 CFR 219.12(e)(1)(iii) Monetary benchmarks which estimate the maximum present net value of those resources having an established market value or an assigned value;
- 36 CFR 219.12(e)(1)(iii)(A) For forest planning areas with major resource outputs that have an established market price, monetary benchmarks shall include an estimate of the mix of resource uses, combined with a schedule of outputs and costs, which will maximize the present net value of those major outputs that have an established market price;
- 36 CFR 219.12(e)(1)(iii)(B) For all forest planning areas, monetary benchmarks shall include an estimate of the mix of resource uses, combined with a schedule of outputs and costs, which will maximize the present net value of those major outputs that have an established market price or are assigned a monetary value;
- 36 CFR 219.12(e)(1)(iii)(C) For forest planning areas with a significant timber resource, estimates for paragraphs (e)(1)(iii)(A) and (B) of this section shall be developed both with and without meeting the requirements for compliance with a base sale schedule of timber harvest, as described in s 219.16(a)(1), and with and without scheduling the harvest of even-aged stands generally at or beyond culmination of mean annual increment of growth, as described in s 219.16(a)(2)(iii). The George Washington NF does not have a significant timber resource.

Timber Maximum PNV Benchmark. This benchmark was established to estimate the schedule of outputs and costs that would maximize the present net value of timber production without any constraints, subject to these specifications:

- The objective function maximizes net present value over the entire planning horizon.
- All tentatively suitable acres are included, without any management prescription allocations.
- No successional habitat constraints are applied.

Several key results of the maximum timber benchmark are:

- 910,000 tentatively suitable acres are allocated to timber production
- Annual harvest is 17.66 MMCF (88.3 MMBF)
- Cumulative Present Net Value over five decades is $112,392,000
- Long-term sustained yield is 19.53 MMCF

Maximum Present Net Value Benchmarks were not modeled for resources other than timber since use of the Spectrum Model (linear programming model that determines the best mix of outputs and activities to maximize an objective function, such as present net value) was confined to timber harvest outputs and activities. There is no method to maximize the present net value of other resources but the present net values of several resource programs under each alternative was evaluated and displayed in the FEIS.

SUMMARY OF SIGNIFICANT ISSUES

Comments received since the start of the process in 2007 through the scoping and public meetings held in 2010 were used to develop the significant issues that guided the development of the alternatives and plan direction. Issues were determined from collaborative workshops and written comments. The significant issues are as follows:

ACCESS

ISSUE STATEMENT: Forest management strategies may affect the balance between public and management needs for motorized access to Forest lands (for recreation, hunting, management activities, fire suppression) and protection of soil and water resources, wildlife populations and habitat, aesthetics, forest health, and desired vegetation conditions.

BACKGROUND: System roads are the primary means of motorized access to the national forest. However, they are also a source of concerns including the environmental effects of roads (on water quality, soil erosion, and habitat) and the social effects on remote settings. Some people would like to see the motorized access to the national forests increased, especially during hunting seasons for big game, for other recreational uses, or to meet forest management needs. Other people, however, feel that road construction should be limited and some existing roads decommissioned. Other comments were made that new roads should not be constructed for the purposes of logging or for OHV use. The amount of motorized access will need to be balanced with wildlife habitat needs, the need to provide both motorized and non-motorized recreational opportunities, the need to protect the soil and water resources, the need to have management access, and the financial capability of maintaining safe and environmentally secure roads.

WATERSHEDS, SOIL AND WATER QUALITY, RIPARIAN RESOURCES AND AQUATIC DIVERSITY

ISSUE STATEMENTS: Management activities may affect soil quality, water quality (surface and groundwater) and riparian resources, including drinking water watersheds and those watersheds with streams impaired due to activities off the Forest. Management activities may affect the maintenance and restoration of aquatic biodiversity and may affect species with potential viability concerns.

BACKGROUND: Providing favorable flows of water was the main objective of the Organic Administration Act that created the forest reserves and of the Weeks Act that allowed the purchase of lands for National Forests in the eastern U.S. Water continues to be one the most important resources produced on the Forest. A number of communities in Virginia and West Virginia obtain their drinking water from the National Forest, whether their water supply watershed is completely within the Forest boundary or their supply is a river that is downstream

from the Forest. The Forest is also an important component of the Chesapeake Bay watershed. There are streams within and downstream of the Forest that have impaired water quality. Most of these impairments are due to acid deposition or to agriculture and none have been attributed to management activities on the Forest. Water quality and aquatic systems can be affected by acid deposition, roads, trails, past storm events, insects and disease, nonnative invasive species and other disturbances. Streams on the forest provide habitat for a number of species at risk, including brook trout and the James spiny mussel. The projections for climate change in this area indicate an increase in temperature, which could affect aquatic species, especially trout populations. Climate change projections are more uncertain on whether precipitation will increase or decrease in the southeast over the next 30-100 years but droughts or extreme weather events each would have impacts to future water quantity and quality conditions. Climate change could also increase acid deposition effects on soil productivity. Currently, the biggest concerns for aquatic habitats on the Forest are sedimentation, future sources of large woody debris for self-maintaining diverse habitat components, canopy cover to maintain water temperature regimes, impacts from roads, and acid rain.

TERRESTRIAL BIOLOGICAL DIVERSITY

ISSUE STATEMENT: Forest Plan management strategies may affect the maintenance and restoration of the diverse mix of terrestrial plant and animal habitat conditions and may affect species with potential viability concerns.

BACKGROUND: Ecological communities provide the foundation for biological diversity. Ecosystems identified on the Forest include communities that predominate on the landscape (e.g. Central Appalachian Dry Oak-Pine Forest); communities that are declining, rare, or unique (e.g. Caves and Karstlands); and communities that provide habitat for species with potential viability concerns (e.g. Special Biological Areas). For the GWNF, management of ecological communities primarily involves the use of timber harvest and fire to influence vegetation composition and structural diversity of habitats. Some comments were concerned about the current age class distribution on the forest being too skewed toward the mid- to late-successional habitats and that management is needed to provide a mosaic of habitats, especially early successional habitat, which is needed by many species. They cited bird and animal species in decline that require early successional habitat at some point in their life cycle. Others thought the focus on the GWNF should be on providing habitat for species requiring late successional habitat or large home ranges since these conditions are rarer on private lands. They stated that private lands can provide for early successional habitat needs and natural disturbances can create openings on the Forest. Some comments identified the importance of the oak-hickory community in the Central and Southern Appalachians for species diversity and are concerned about oak regeneration and the continuity of future hard mast production.

OLD GROWTH

ISSUE STATEMENT: Forest management strategies may affect the potential biological and social values associated with the abundance, distribution and management of existing and future old growth.

BACKGROUND: Nearly all the lands that became the George Washington National Forest had been harvested at least once before becoming National Forest System lands. However, in many areas of the Forest, stands of trees have reached ages and structural conditions that qualify as “old growth” under the current definitions used in the Southern Region of the Forest Service. Old growth communities provide both biological and social values. Old growth trees provide large cavity trees for wildlife species such as black bear, birds, other cavity nesters, and large downed woody habitat for other species such as salamanders. Ecologically, old growth provides elements for biological richness, gene conservation, and riparian area enhancement. Old growth areas also provide certain recreational experiences, research opportunities, educational study, and provide historical, cultural, and spiritual values. Some may never visit an old growth site, but will receive satisfaction from knowing that it exists. On the other hand, old growth areas can be a source of large-diameter, high-value hardwoods, which are limited in supply and in high demand for such specialty products as furniture, musical instruments, and timberframe homes. Others say that insect and disease risk can be relatively high in old growth stands and could (for some community types) threaten the retention of those stands as old growth. There is concern that fire exclusion could favor a buildup of fire-intolerant, but shade-tolerant, species that could eventually replace the original old growth type. Another view is that active management, including timber harvest and prescribed fire, could be used to accelerate the development of old growth attributes.

FOREST HEALTH

ISSUE STATEMENT: Forest Plan management strategies may affect the spread and control of nonnative invasive species, forest pests, and pathogens, all of which have the potential to affect long-term sustainability, resiliency, and composition of forest ecosystems.

BACKGROUND: While the term "Forest Health" can have several meanings, it is used here to identify the effects of invasive species. While not all nonnative species are known to disrupt native ecosystems, of particular concern are those that are successful at invading and rapidly spreading through natural habitats. These include a wide variety of organisms such as the chestnut blight fungus, gypsy moth, hemlock wooly adelgid, didymo algae, and Ailanthus. In addition to these non-native species, forest health also includes the native southern pine bark beetles. Invasive species create a host of harmful environmental effects to native ecosystems including: displacement of native plants; degradation or elimination of terrestrial and aquatic habitat; extirpating rare species; impacting recreation; affecting fire frequency; altering soil properties; and decreasing native biodiversity. Invasive species spread across landscapes, unimpeded by ownership boundaries. Control of existing populations, prevention of the spread of known invasive species, mitigation of existing problems, and prevention of the introduction of new invasives are all components of this issue.

WIND ENERGY

ISSUES STATEMENT: Responding to opportunities to develop wind energy generation may result in effects on a wide variety of resources (including birds, bats, scenery, trail use, soils on ridgetops, water, noise, remote habitat, local communities/economies, and social values).

BACKGROUND: Wind energy is renewable and can reduce the use of fuels generating carbon gases, reduce acid deposition, and positively affect climate change. The USDA Forest Service and National Renewable Energy Laboratory (2005) identified 35,810 acres (primarily ridgetops) of the GWNF with a high potential for wind area development. The GWNF is in close proximity to growing population centers that would benefit from additional and clean energy production. However, there are concerns about the effects of utility-scale wind tower development to water, birds, bats, views, visuals, aesthetics (height of towers), noise, carbon sequestration, and fragmentation of habitat. These concerns relate to both construction and operation of utility-scale wind turbines and the associated infrastructure development to support the turbines (roads, powerlines). Some people believe that this need for wind energy development can and should be met on private lands, or that the power would not be used to solve local needs. Other people believe that the National Forests should contribute to the development of renewable resources and green energy.

OIL AND GAS LEASING

ISSUE STATEMENT: Use of National Forest System lands to support energy needs through federal oil and gas leasing may affect forest resources and impact adjacent private lands.

BACKGROUND: Energy production has long been a component of National Forest System management and gas development provides energy to meet national needs. There are no active gas wells currently in production on the Forest and only about 10,200 acres are currently under lease for gas and oil. A particular type of gas well operation is the development of gas deposits within the Marcellus shale formations, through horizontal drilling and use of hydraulic fracturing at numerous locations throughout the horizontal bore holes. Concerns about hydraulic fracturing include the quantity of water needed in the process, negative effects on water quality (ground and surface), wildlife, air quality, viewsheds, forest fragmentation, road systems, nearby private landowners, and ecotourism. Some public comments identified that developing Marcellus shale gas is okay when it is properly regulated and that National Forest System land should be available for leasing Marcellus shale so that people can maintain their standard of living and meet energy needs. Other comments stated that there must be an effects analysis for hydraulic fracturing or that there should be a moratorium on development until federal/state regulations are in place and an on-going EPA study is complete. Other comments are opposed to this development or want limitations on where it could be used.

FIRE

ISSUE STATEMENT: The management of fire to achieve goals related to protection of property, wildlife habitat, ecosystem diversity and fuels management may affect air quality, non-native invasive species, recreation, water quality, wildlife, and silviculture.

BACKGROUND: Fire is acknowledged as an important part of some ecosystems on the Forest. Aggressive control of wildfire throughout much of the twentieth century resulted in changes to these ecosystems. Management of both wildfire and prescribed burning can serve to restore and maintain these ecosystems, while also protecting National Forest and adjacent lands from negative effects of fire. Some people support the continued and increased use of prescribed fire to restore ecosystems, create wildlife habitat, encourage oak regeneration and reduce fuels. Some comments support the proposed increase in use of prescribed fire, but caution that fire does not replace timber harvest as a management tool; rather it should be considered an additional option for timber management. Some comments identified concerns with prescribed burning, including impacts on adjoining private land, carbon emissions, native vegetation, invasive species, stream sedimentation, and air pollution. Some people indicated support for using lightning ignited fires only to achieve ecosystem restoration goals.

RECREATION

ISSUE STATEMENT: Forest management strategies should determine an appropriate mix of sustainable recreational opportunities (including trail access) that responds to increasing and changing demands and also provides for public health and safety and ecosystem protection (such as soil and water resources, nesting animals, riparian resources and spread of non-native invasive species).

BACKGROUND: The Forest is within a day's drive for a large population of people in the eastern U.S. Local and regional visitors use the forest for a variety of recreational opportunities, from primitive hiking and camping to developed recreation sites and motorized travel. Developed recreation is not a significant issue. Demand for long-distance trails for special recreation events, such as long-distance mountain bicycling, equestrian endurance rides and runner marathons, has increased in recent years. The demand is greatest among the equestrian and mountain biking communities. There is more demand than supply for motorized trail opportunities as opportunities for such use is very limited on private land. Some people stated that off-highway and all-terrain vehicle use is not appropriate on National Forest due to concerns about noise, and potential environmental damage, and felt the need could be met commercially on private lands.

WILDERNESS/ROADLESS

ISSUE STATEMENT: Forest management strategies may affect the balance between the desires for permanent protection of remote areas and the desires for management flexibility and ability to respond to changes in ecological, social and economic conditions when identifying areas to be recommended for Wilderness and determining how potential wilderness areas and other remote areas should be managed.

BACKGROUND: Management of remote areas on the Forest continues to be one of the most prominent issues raised in comments. Remote areas include existing Wilderness, the Inventoried Roadless Areas identified in the 1993 GW Forest Plan Revision (and incorporated into the 2001 Roadless Area Conservation Rule), and the Potential Wilderness Areas (identified as areas meeting the definition of wilderness that need to be evaluated in the current revision process). Public rationale for additional wilderness includes: ecological values of remote, intact areas; recreational values; proximity of large masses of people to the Forest; protection of watersheds through permanent protection; carbon sequestration; ability for latitudinal movement for species due to climate change; future scientific reference; and a need to bring the amount of wilderness on the Forest more in line with amounts on other National Forests. Public rationale opposing wilderness includes: lack of balance of forest age classes (many species are threatened without early successional habitat); limitations on recreation use by those less physically fit; limitations on group size for recreation events; limitations on special use events; prohibiting all motorized and mountain bike access; restrictions on treatment of invasive species; limitations on meeting energy resource demands; limitations on emergency access; firefighting restrictions; and limiting options as conditions or future demands change.

The GWNF has 23 Inventoried Roadless Areas (IRAs) with a total of 242,278 acres. As part of the revision process, the Forest has identified 37 areas as Potential Wilderness Areas (PWAs) with a total of 372,631 acres. The PWA inventory includes all of the IRAs, with the exception of Southern Massanutten and The Friars. For the remote areas in the PWA inventory that are not identified for Recommended Wilderness Study by Congress, some people would like to see them managed according to the direction in the 2001 Roadless Area Conservation Rule (RACR) and others would like to see them actively managed for wildlife habitat and timber production.

TIMBER HARVEST

ISSUE STATEMENT: Forest Plan management strategies may affect: a) the amount and distribution of land suitable for the sustainable harvest of timber products; b) the amount of timber offered by the Forest; c) the role of timber harvest in benefitting local economies and other multiple use objectives; and d) the methods used to harvest the timber. If the Forest responds to needs for biomass for energy production, whole tree harvesting may affect nutrient cycling, wildlife habitat, and soil productivity and stability. Timber harvest may have effects on other resources.

BACKGROUND: Timber harvest is one of the tools used to manage vegetation on the Forest to create a diversity of habitat conditions. It also produces wood products that benefit local economies. The ecological, social, and economic effects of the timber management program on the GWNF, both positive and negative, are of great importance to many. Some people strongly state that the forest should reduce the acres suitable for harvest, reduce the Allowable Sale Quantity (ASQ), and decrease the commercial timber program due to adverse impacts to: water quality, competition with private lands, air quality, scenery, ecological habitats such as large areas of intact forest (fragmentation), and a wide variety of other ecological/environmental resources. Some indicate that commercial timber harvest on the Forest is not economically viable and competes with privately held timber, that demand for timber can be met on private land, or that the level of the timber sale program should be based on reasonable budget expectations. Other people strongly support an expanded timber program because of the positive impacts on: balancing age classes and reducing acres of an aging forest, maintaining species composition, wildlife habitat, responding to an increased demand for wood products (including biomass), reduction of hazardous fuels, and benefits to local economies. Therefore, there should be an increase in suitable acres and Allowable Sale Quantity.

The potential use of forest wood and fiber as biomass for energy production raises concerns on the effects on carbon sequestration and on the removal of too much organic material which could increase soil erosion and/or remove too many nutrients from the site, particularly in low site index areas or areas affected by acid deposition. Some people believe that the Forest should contribute to this green energy demand while meeting other resource needs (fuels reduction and wildlife habitat), that this will produce green jobs and wood products, and that it is better to burn the trees for fuel rather than burning them as part of prescribed burns. Other people don't believe that biomass fuels are a green source of energy, don't believe that energy should take precedence over forest health, or believe that biomass will compete with pulpwood and drive up prices.

ECONOMICS AND LOCAL COMMUNITY

ISSUE STATEMENT: Management activities may affect the economic role of the Forest, particularly the role it plays in the economy of local communities, including the production of ecosystem services and commodity outputs. Increasing population and development near the Forest may influence access to the National Forest and management activities such as special use requests, fire management, and responses to additional recreation demands.

BACKGROUND: Some outputs from management activities can be readily valued such as timber, firewood, and recreation fees. Ecosystem services are the suite of goods and services from the Forest that are vital to human health and livelihood and are traditionally viewed as free benefits to society, or "public goods" - wildlife habitat and diversity, watershed services, carbon storage, and scenic landscapes, for example. These outputs and services can all be important to many of the rural communities in and around the National Forest. Several categories of activities identified as important to local communities include tourism (family-based nature activities, recreation events, aggressive trail experiences like all-terrain vehicle trails, equestrian and mountain

bike use, wilderness, new trails), habitat management that increases diversity for wildlife viewing and game populations for hunting, and timber production that supports the logging industry.

CLIMATE CHANGE

ISSUE STATEMENT: Changes in climate may require adaptation strategies that facilitate the ability of ecosystems and species to adapt to changes in conditions (such as stream temperature, community vegetation composition, and invasive species). Forest management activities may exacerbate the impacts of climate change or mitigate the impacts through adding to or sequestering carbon or enhancing opportunities for alternative energy sources (wind, biomass, solar).

BACKGROUND: In developing management strategies to deal with a changing climate, it has been recognized that forests can play an important role in both mitigating and adapting to climate change. Mitigation measures focus on strategies such as carbon sequestration by natural systems, ways to increase carbon stored in wood products, ways to provide renewable energy from woody biomass to reduce fossil fuel consumption, and ways to reduce environmental footprints. Adaptation measures address ways to maintain forest health, diversity, productivity, and resilience under uncertain future conditions so that forest resources can better adapt to change. Based on current projections, the primary regional-level and state-level predicted effects of climate change that would impact the GWNF include: (1) warmer temperatures; (2) extreme weather events; and (3) increased outbreaks of insects, disease, and nonnative invasive species. Comments suggested that the Plan should address reducing current threats to forest conditions, such as from non-native invasive species, pests and pathogens, acid deposition, and human uses of forest resources. Some comments identify the need to provide migration corridors, which include altitudinal gradients, for plant and animal species, especially those most vulnerable to changing climate conditions. Other comments requested that we evaluate how management activities may exacerbate, mitigate or enhance effects of a changing climate. Others identified the importance of the forest's role in carbon sequestration.

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APPENDIX F: GLOSSARY

ACRONYMS

AA - analysis area
ADA - Americans with Disabilities Act
A.E. – acre equivalent
AMS - Analysis of the Management Situation
APHIS - Animal and Plant Health Inspection Service
ARPA - Archaeological Resources Protection Act
ASQ - allowable sale quantity
AT - Appalachian Trail
ATV - all-terrain vehicle
AUM - animal unit month
BA - basal area; Biological Assessment
BE - Biological Evaluation
BEA - Bureau of Economic Analysis
BF - board foot
BLM – Bureau of Land Management
BMP - best management practice
BO - Biological Opinion
BSS - base sale schedule
CAA - Clean Air Act
CCF - hundred cubic feet
CE - categorical exclusion
CEQ - Council on Environmental Quality
CF - cubic foot
CFR - Code of Federal Regulations
CFS - cubic feet per second
CMAI - culmination of mean annual increment
CVH - cove hardwood
CWA - Clean Water Act
DBH - diameter at breast height
DEIS - Draft Environmental Impact Statement
DFC - desired future condition
EA - Environmental Assessment
EAM - even-aged management
ECS - Ecological Classification System
EIS - Environmental Impact Statement
EMU - ecological management unit
EPA - Environmental Protection Agency
ESA - Endangered Species Act
EWPP- Emergency Watershed Protection Plan
FEIS - Final Environmental Impact Statement
FH - Forest Highway
FIA - Forest Inventory and Analysis
FMAP - Fire Management Action Plan
FONSI - Finding of No Significant Impact
FR - Forest Road
FRCC - Fire Regime Condition Classes
FSH - Forest Service Handbook
FSM - Forest Service Manual
FSVEG – Field Sampled Vegetation system, replaces previous stand inventory database called CISC
FTE - full-time employee
FY - fiscal year

GAO - Government Accounting Office
GIS - Geographic Information System
GDP - gross domestic product
GWNF - George Washington National Forest
GWJNF - George Washington & Jefferson National Forests
HRP - Human Resource Program
HUC - Hydrologic Unit Code
HWA – Hemlock woolly adelgid
IDT - Interdisciplinary Team
IMPLAN - Impact Analysis for Planning
INFRA - Infrastructure
IPM - integrated pest management
IS - Interpretive Services
JNF - Jefferson National Forest
LAC - Limits of acceptable change
LANDFIRE - Landscape Fire and Resource Management Planning Tools Project
LAR - Land Area Report
LE - law enforcement
LOAP - Landownership Adjustment Plan
LRMP - Land and Resource Management Plan
LTSYC - long-term sustained-yield capacity
L&WCF - Land and Water Conservation Fund
LWD - large woody debris
M - thousand
M$ - thousands of dollars
M&E - monitoring and evaluation
MA - management area
MAI - mean annual increment
MAR - Management Attainment Report
MAUM - thousand animal unit month
MBF - thousand board feet
MCF - thousand cubic feet
MIL - management intensity level
MIS - management indicator species
MM - million
MM$ - millions of dollars
MMBF - million board feet
MMCF - million cubic feet
MMR - minimum management requirement
MMRVD - million recreation visitor-days
MOU - memorandum of understanding
MRVD - thousand recreation visitor-day
MVUM – motorized vehicle use map
MWFUD - thousand wildlife and fish user-day
NAAQS - National Ambient Air Quality Standards
NAPAP - National Acid Precipitation Assessment Program
NEPA - National Environmental Policy Act
NF - National Forest
NFMA - National Forest Management Act
NFRS - National Forest Recreation Survey
NFS - National Forest System
NHPA - National Historic Preservation Act
NLFCA - National Listing of Fish Consumption Advisories
NNIP – non-native invasive plants
NNIS – non-native invasive species
NOI - Notice of Intent

NPS - National Parks Service
NRCS - Natural Resources Conservation Service
NRIS - Natural Resource Information System
NTMB - neotropical migratory birds
NVUM - National Visitor Use Monitoring
NWPS - National Wilderness Preservation System
OHV - off-highway vehicle
OMP - operation maintenance and protection
PAOT - persons-at-one-time
PILT - Payment in Lieu of Taxes
PL - public law
PM - particulate matter
PNV - present net value
PNW - present net worth
PSD - prevention of significant deterioration
PSI - pounds per square inch
RAP - Roads Analysis Process or Procedure
RARE - Roadless Area Review and Evaluation
RARE II - the second Roadless Area Review and Evaluation
RBP - Rapid Bioassessment Protocol
(RFD) - reasonable foreseeable development scenario
RLRMP - Revised Land and Resource Management Plan
RMO - Road Management Objectives
RNA - research natural area
RN - roaded natural
ROD - record of decision
ROS - Recreation Opportunity Spectrum
ROW - right-of-way
RPA - Resources Planning Act
RVD - recreation visitor-day
SAA - Southern Appalachian Assessment
SBA – special biological area
SCORP - State Comprehensive Outdoor Recreation Plan
S&G - standard and guideline
SH - state highway
SHPO - State Historic Preservation Officer
SIC - Standard Industrial Code
SIO - Scenic Integrity Objective
SIP - State Implementation Plan
SMS - Scenery Management System
SPB - southern pine beetle
SPM - semi-primitive motorized
SPNM - semi-primitive non-motorized
SMZ - Streamside Management Zone
SYP - southern yellow pine
T&E - threatened and endangered species
T/E/S - threatened, endangered, and sensitive species
TESLR - threatened, endangered, sensitive, and locally rare species
TNC - The Nature Conservancy
TSI - timber stand improvement
TSP – total sale program
TVA - Tennessee Valley Authority
UPH - upland hardwood/mixed
USC - United States Code
USDA - U.S. Department of Agriculture
USDI - U.S. Department of Interior

USFWS - U.S. Fish and Wildlife Service
USGS - U.S. Geological Survey
VMS - Visual Management System
VMEIS - Vegetation Management Environmental Impact Statement
VQO - visual quality objective
W&SR - Wild and Scenic River
WFUD - wildlife and fish user-day
WIN - Watershed Improvement Inventory
WO - Washington Office
WPN - white pine
WRP - Wetlands Reserve Program
WSA - wilderness study area
YPN - yellow pine

DEFINITIONS

A

abiotic: Not related to, or caused by, living organisms. For example, the climate is an abiotic component of ecosystems.

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.

accessible facility: A single or contiguous group of improvements, that exists to shelter or support Forest Service programs that is in compliance with the highest standard of current Federal or Forest Service accessibility guidelines, at the time of construction.

acid deposition: Rain, snow, or 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.

acquisition: Obtaining land through purchase, exchange or donation.

acre-foot: A measurement of water volume, equal to the amount of water that would cover an area of 1 acre to a depth of 1 foot (specifically 43,560 cubic feet or 325,851 gallons).

activity: A measure, course of action, or treatment that is undertaken to directly or indirectly produce, enhance, or maintain forest and rangeland outputs or achieve administrative or environmental quality objectives.

activity area: The area on the Forest where soil disturbing management activity can occur. Used to provide a basis to compare the extent of effects to.

adaptive management: A dynamic approach to forest management in which the effects of treatments and decisions are continually monitored and used, along with research results, to modify management on a continuing basis to ensure objectives are being met.

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.

aerial logging: A yarding system employing aerial means, (e.g., helicopters, balloons), to lift logs.

age class distribution: An age-class is a distinct aggregation of trees originating from a single natural event or regeneration activity, or a grouping of trees, e.g., a 10-year age class, as used in inventory or management. An age-class distribution is the location and/or proportionate representation of different age classes in a forest.

agricultural land: Areas used primarily for production of food and/or fiber (excludes wood fiber). Examples include cropland, pasture, orchards, vineyards, nurseries, confined feeding areas, farmsteads, and ranch headquarters.

air pollution: Any substance or energy form (heat, light, noise, etc.) that alters the state of the air from what would naturally occur.

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.

air quality (PSD) class: Three broad classifications established by the Clean Air Act to help prevent significant deterioration of air quality for all areas of the country that are known (or assumed) to be attaining NAAQS.

Class I: Select wilderness areas and national parks where identified air quality related values might become (or currently are) adversely affected by even a small increment of additional air pollution. To date, there are 156 such areas, nation-wide.
Class II: Areas the states may designate to receive such additional amount of air pollution (even up to 30 times the Class I area increment) that air quality may deteriorate from baseline to (but not below) NAAQS. To date, there are no such areas, nation-wide.
Class III: All other areas, by default, where a moderate level of additional air pollution is deemed acceptable. The bulk of the U.S.

air quality related values: Terminology used in the PSD portion of the Clean Air Act describing values associated with certain resources that may become impaired by air pollution. Typically, these include aquatic habitats, terrestrial habitats and visibility. Visibility refers to the ability of an air mass to convey the landscape image.

all aged stand: See uneven-aged.

allocated fund: Funds transferred from one agency or bureau to another for carrying out the purpose of the parent appropriation and agency.

allocation: The assignment of management prescriptions or combination of management practices to a particular land area to achieve the goals and objectives of the alternative.

allopatric: Condition where one species lives in a section of stream without other closely related species. The species have disjunct distributions. Opposite of sympatric.

allotment management plan: The basic land unit used to facilitate management of the range resource on National Forest System and associated lands administered by the Forest Service.

allowable sale quantity (ASQ): The quantity of timber that may be sold from the area of suitable land covered by the Forest Plan for a time period specified by the Forest Plan. This quantity is usually expressed on an annual basis as the "average annual allowable sale quantity." The quantity is a ceiling rather than a future sales level projection or target. (36 CFR 219.3, 1982).

all-terrain vehicle (ATV): Any motorized, off-highway vehicle 50 inches or less in width, having a dry weight of 600 pounds or less that travels straddled by the operator and has steering controlled by handlebars.

alternative: In forest planning, a mix of resource outputs designed to achieve a desired management emphasis as expressed in goals and objectives, and in response to public issues or management concerns.

amenity values: Features or qualities which are pleasurable or aesthetic, as contrasted with the utilitarian features of a plan, project, location, or resource.

analysis area: A collection of lands, not necessary contiguous, sufficiently similar in character, that they may be treated as if they were identical.

analysis area identifier: A resource characteristic used to stratify the land into capability areas and analysis areas.

Analysis of the Management Situation (AMS): A determination of the ability of the planning area to supply goods and services in response to society's demand. The Forest Plan includes a summary of the AMS. Information from it is contained throughout the EIS/Plan.

animal unit month: The quantity of forage required by one mature cow and her calf (or the equivalent, in sheep or horses), for one month; 682 pounds of air-dry forage.

annual forest program: The summary or aggregation of all projects that make up an integrated (multifunctional) course of action for a given level of funding of a forest planning area that is consistent with the Forest Plan.

annual work planning process: Preparation of technical plans that serve to implement land and resource management, and program decisions contained in the integrated land, resource plans, and budget allocations.

appropriated fund: Funds available for obligation or outlay by Congress to a given agency.

appropriate management response: The response to a wildland fire based on an evaluation of risks to firefighter and public safety. Evaluation includes the consideration of: 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.

aquatic ecosystem: Components that include: the stream channel, lake and estuary beds, water, biotic community, and associated habitat features. Also included are streams and lakes with intermittently, semipermanently, and seasonally flooded channels or streambeds. In the absence of flowing water, intermittent streams may have pools or surface water.

aquatic habitat types: The classification of instream habitat based on location within channel, patterns of water flow, and nature of flow controlling structures. Habitat is classified into a number of types according to location within the channel, patterns of water flow, and nature of flow controlling structure. Riffles are divided into three habitat types: low gradient riffles, rapids, and cascades. Pools are divided into seven types: secondary channel pools, backward pools, trench pools, plunge pools, lateral scour pools, dammed pools, and beaver ponds. Glides, the third habitat type, are intermediate in many characteristics between riffles and pools. It is recognized that as aquatic habitat types occur in various parts of the country, additional habitat types may have to be described. If necessary, the regional fishery biologist will describe and define the additional habitat types.

aquifer recharge: Adding water to a wet underground layer of water-bearing permeable rock or unconsolidated materials (gravel, sand, silt, or clay) from which groundwater can be usefully extracted using a water well.

arterial roads: Roads that provide service to large land areas and usually connect with public highways or other forest arterial roads to form an integrated network of primary travel routes. The location and standard are often determined by a demand for maximum mobility and travel efficiency rather than specific resource management service. They are usually developed and operated for long-term land and resource management purposes and constant service. These roads generally serve areas more than 40,000 acres.

aspect: A ground surface that faces in a given direction.

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

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.

basal spray: The application of a pesticide, usually an herbicide for controlling brush or weed trees, directed at the base of the stem.

base sale schedule: A timber sale schedule formulated on the basis that the quantity of timber planned for sale and harvest for any future decade is equal to, or greater than, the planned sale and harvest for the preceding decade. The planned sale and harvest for any decade must not be greater than the long-term sustained yield capacity. (36 CFR 219.3, 1982 rule)

best management practice (BMP): A practice, or a combination of practices determined to be the most effective and practical means of preventing or reducing the amount of pollution generated by non-point sources to a level compatible with water quality goals.

biodiversity: The variety of life in an area, including the variety of gene pools, species, plant and animal communities, ecosystems, and the processes through which individual organisms interact with one another, and their environments.

biological assessment (BA): Information prepared by a federal agency to determine whether a proposed action is likely to: 1) adversely affect listed (threatened, endangered, or proposed) species, 2) jeopardize the continued existence of species, or 3) adversely modify critical habitat. BAs must be prepared for “major construction activities”. The outcome of the BA determines whether formal consultation or a conference with the US Fish and Wildlife Service is necessary.

biological control: The use of natural means, or agents, to control unwanted pests. Examples include introduced or naturally occurring insects, bacteria, or fungi that act as predators, parasites, or disease agents of pests. Biological controls can sometimes be alternatives to mechanical or chemical means.

biological evaluation (BE): A documented Forest Service review of its programs or activities in sufficient detail to determine how an action or proposed action may affect any endangered, threatened, or sensitive species.

biological growth potential: The average net growth attainable on a fully-stocked natural forest land.

biological opinion (BO): An official report by the US Fish and Wildlife Service 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.

biological oxygen demand: Dissolved oxygen required by organisms for the aerobic biochemical decomposition of organic matter present in water.

biomass: The amount of living matter in a given habitat, expressed either as the weight of organisms per unit area or as the volume of organisms per unit volume of habitat.

biotic: Refers to live components of an ecosystem. For example, green plants and soil microorganisms are biotic components of ecosystems.

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. The conversion factor used in the preparation of this document is 5.5 board feet = 1 cubic foot.

borrow: In highway construction, materials used in the roadbed that are excavated from native materials in ground generally close to the road bed; the term "borrow" implies the excavation, hauling and spreading of the material from designated pits.

borrow pit: An excavation made for the purpose of obtaining earth, rock, or other fill material for use in construction.

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.

canopy closure: The percent cover of the tree canopy in a stand.

capability: The potential of a land area to produce resources, supply goods and services, and allow resource uses under an assumed set of management practices and a given level of management intensity. Note: capability depends upon the current condition and site conditions including climate, slope, land form, soil and geology, and the application of management practices and protection from fire, insects, and disease.

carbon sequestration: the prevention of greenhouse gas build-up in the earth's atmosphere by methods such as planting trees to absorb carbon dioxide or pumping carbon dioxide into underground reservoirs.

carrying capacity: The number of organisms of a given species and quality that can survive in, without causing deterioration of, a given ecosystem through the least favorable environmental conditions that occur within a stated interval of time.

category 1 (or 2) species: The Regional Forester of the Southern Region established a Regional Invasive Exotic Plant Species List. Category 1 species are defined as exotic species that are known to be invasive and persistent throughout all of most of their range within the Southern Region. They can spread into and persist in native plant communities and displace native plant species and therefore pose a demonstrable threat to the integrity of the natural plant communities in the Region. Category 2 species are defined as exotic plant species that are suspected to be invasive or are known to be invasive in limited areas of the Southern Region. Category 2 species will typically persist in the environment for long periods once established and may become invasive under favorable conditions.

channeled ephemeral streams: Ephemeral streams that have a defined channel of flow where surface water converges with enough energy to remove soil, organic matter, and leaf litter. Ones that exhibit an ordinary high watermark and show signs of annual scour or sediment transport are considered navigable waters of the United States (USACE, Part 330: Nationwide Permit program, 2000).

chemical control: The use of pesticides to control pests or undesirable species. Contrast with biological control and mechanical control.

chemical site preparation: The killing or retardation of competing vegetation to prepare an area for reforestation, using herbicide.

class I areas: See air quality class.

cleaning: A release treatment made in an age class, not past the sapling stage, in order to free the favored trees from less desirable individuals of the same age class which can overtop them.

clearcutting: The harvesting in one cut of all trees on an area for the purpose of creating a new, even-aged stand. The area harvested may be a patch, stand, or strip large enough to be mapped or recorded as a separate age class in planning for sustained yield under area regulation. A method of regenerating an even-aged stand. Regeneration is from natural seeding, direct seeding, planted seedlings, and/or advance reproduction. Harvesting may be done in groups or patches (group or patch clearcutting), or in strips (strip clearcutting). In the clearcutting system, the management unit or stand in which regeneration, growth, and yield are regulated consists of the individual clearcut stand.

clearcutting with reserves: A two-aged regeneration method in which varying numbers of reserve trees are not harvested to attain goals other than regeneration.

climax: The culminating stage in plant succession for a given environment with the vegetation having reached a highly stable condition.

coarse woody debris: See large woody debris.

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.

cold water fishery: Aquatic habitats that predominately support fish species that have temperature tolerances up to about 70°F, and exhibit their greatest reproductive success at temperatures below 65°F (18.3^{o}C).

collector road: Roads that serve smaller land areas and are usually connected to a forest arterial or public highway. They collect traffic from forest local roads or terminal facilities. The location and standard are influenced by long-term multi-resource service needs, and travel efficiency. Forest collector roads may be operated for constant or intermittent service, depending on land-use and resource management objectives for the area served by the facility. These roads generally have two or more local roads feeding into them and generally serve an area exceeding 10,000 acres.

colluvial: Loose earth material that has accumulated at the base of a hill, through the action of gravity, as piles of talus, avalanche debris, and sheets of detritus moved by soil creep or frost action.

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.

commercial timber harvest: Any type of timber sale that produces merchantable wood products where the value of the product(s) usually is equal to or exceeds the direct cost of harvesting.

commercial tree species: (1) Tree species suitable for industrial wood produces. (2) Conifer and hardwood species used to calculate the commercial forest land allowable sale quality.

commodity outputs: A resource output with commercial value. All resource products that are articles of commerce.

compaction: Increased soil density (weight per unit volume) and strength that hampers root growth, reduces soil aeration, and inhibits soil water movement. Measurements pertain to the critical surface layers that

typically contain a high proportion of the soil's organic matter and nutrients and or strongly affect water retention and movement in the soil.

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.

concentrated use area (CUA): An undeveloped site or area located within a general forest area, generally not in the Infrastructure system, but receiving investments of management time and/or dollars because recreation use leaves evident impacts such as litter, vandalism or soil compaction. Any amenities in a CUA are placed and managed for resource protection rather than user convenience.

concern level: A particular degree or measure of viewer interest in the scenic qualities of the landscape as viewed from travelways and use areas, rated level 1 (highest concern) to 3 (lowest concern).

concession: The granting of an operation and maintenance of a recreation facility to a private business through a special use authorization.

condition class (fire regimes): Fire Regime Condition Classes (FRCC) are a measure describing the 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. One or more of the following activities may have caused this departure: fire suppression, timber harvesting, livestock grazing, introduction and establishment of exotic plant species, introduced insects or disease, or other management activities. Condition Class 1 lands have fire regimes that are within the historical range of variation (HRV) and whose vegetation attributes (species composition, structure, and function) are intact. Fire behavior, effects and other associated disturbances are similar to those that occurred prior to fire exclusion (suppression). Condition Class 2 lands have a moderate departure from the historic range of variation and Condition Class 3 lands have a high departure.

connectivity: Condition in which the spatial arrangement of land cover types allows organisms and ecological processes (such as disturbance) to move across the landscape. Used in this sense, connectivity is the opposite of fragmentation.

constraint: A restriction or limit that must be met.

controlled surface use stipulation: Use and occupancy is allowed for fluid mineral development (unless restricted by another stipulation), but the identified resource values require special operational constraints that may modify the lease rights.

conventional logging: A term used to identify methods commonly used in an area to move logs from stump to mill.

conversion (forest management): A change from one forest type to another in a stand on land that has the capability of both forest types.

coppice: A method of regenerating a stand in which all trees in the previous stand are harvested and the majority of regeneration is from stump sprouts or root suckers.

coppice with reserve: A two-aged regeneration method in which reserve trees are retained to goals other than regeneration. This method normally creates a two-aged stand.

cord: A unit of gross volume measurement for stacked, round wood based on external dimensions, generally implies a stack of 4 x 4 feet vertical cross section and 8 feet long. Contains 128 stacked cubic feet.

corridor: A linear strip of land identified for the present or future location of transportation or utility rights-of-way within its boundaries. It can also be identified for wildlife habitat connecting, or protecting forest resources.

Council on Environmental Quality (CEQ): An advisory council to the president established by the National Environmental Policy Act of 1969. It reviews federal programs for their effect on the environment, conducts environmental studies, and advises the president on environmental matters.

cove: The head of a small valley or drainage, typically in a moist shaded and protected site.

creel survey: A survey of anglers.

critical habitat: Habitat, determined by the Secretary of Interior, essential to the conservation of the endangered or threatened species.

crown class: A class of tree based on crown position relative to the crowns of adjacent trees.

dominant: Trees with crowns extending above the general level of the main canopy of even-aged groups of trees. They receive full light from above, and partly from the sides.

co-dominant: Trees with crowns forming the general level of the main canopy in even-aged groups of trees. They receive full light from above, and comparatively little from the sides.

intermediate: Trees with crowns extending into the lower portion of the main canopy of even-aged groups of trees, but shorter in height than the co-dominants. They receive little direct light from above, and none from the sides.

overtopped (suppressed): Trees of varying levels of vigor that have their crowns completely covered by the crowns of one or more neighboring trees.

cubic foot: A unit of measure reflecting a piece of wood 12 inches long, 12 inches wide, and 12 inches thick.

culmination of mean annual increment: Age at which average rate of annual tree growth stops increasing and begins to decline. Mean annual increment is expressed in cubic feet measure and is based on expected growth, according to the management intensities and utilization standards assumed in accordance with 36 CFR 219.16(a)(2)(i) and (ii). Culmination of mean annual increment includes regeneration harvest yields, and any additional yields from planned intermediate harvests.

cultural resources: Physical remains of districts, sites, structures, buildings, networks or objects that were used by humans. They may be historic, prehistoric, archaeological, architectural or spiritual in nature. Cultural resources are non-renewable.

cunit: Equivalent to 100 cubic feet of solid wood. Commonly, 100 cubic feet is expressed as 1 CCF.

cutting cycle: The planned interval between partial harvests in a stand being managed with an uneven-aged regeneration method.

D

daylighting: The practices of cutting back edges of roads or trails by removing shrub and tree growth.

decision criteria: Rules or standards used to evaluate and rank alternatives.

decommission: Activities that result in the stabilization and restoration of unneeded roads to a more natural state (36 CFR 212.1, Forest Service Manual 7734 - Travel Management [USDA FS 2009]). The Forest Service Manual identifies five levels of treatments for road decommissioning which can achieve the intent of the definition. These five treatments give a range of options for stabilizing and restoring unneeded roads. In some situations, blocking the entrance may meet restoration objectives. In other situations, restoring hillslope hydrology may require full obliteration or re-contouring. Local factors such as climate, geology, topography, soil,

and road design and construction also factor into the stabilization and restoration objectives. These five treatment options include:

1. Reestablishing former drainage patterns, stabilizing slopes, and restoring vegetation;
2. Blocking the entrance to a road or installing water bars;
3. Removing culverts, reestablishing drainages, removing unstable fills, pulling back road shoulders, and scattering slash on the roadbed;
4. Completely eliminating the roadbed by restoring natural contours and slopes; and
5. Other methods designed to meet the specific conditions associated with the unneeded road.

decomposition: The physical and chemical breakdown of organic matter by bacterial and fungal action into simpler chemical compounds.

demand: The amount of an output that users are willing to take at specified price, time period and condition of sale.

demand species: Animal species commonly associated with recreation (e.g. hunting, fishing, viewing).

dendropyrochronology: The science that uses tree rings to date and study past and present changes in wildfires.

den trees: Trees having rainproof, weather: tight cavities used by wildlife.

desired condition: An expression of resource goals that have been set for a unit of land. It is written as a narrative description of the landscape as it appears when goals have been achieved.

desired landscape character: Appearance of the landscape character to be retained or created over time, recognizing that a landscape is a dynamic and constantly changing community of plants and animals. It includes the combination of landscape design attributes and opportunities, and biological opportunities and constraints.

developed recreation: Recreation use or opportunities occurring at developed sites.

developed recreation site: Relatively small, distinctly defined area where facilities are provided for concentrated public use. Examples include campgrounds, picnic areas, and swimming areas.

development level: An indication of site modification based on classes in the Recreation Opportunity Spectrum. Development Level 1 equates to Primitive, with minimum site modification; 2 equates to Semi-Primitive Motorized/Non-motorized, with little site modification; 3 equates to Roaded, with moderate modification; 4 equates to Rural, with heavy site construction; and 5 relates to Urban, with a high degree of site modification. See Facilities level, below, and FSM 2330.3, Exhibit 1.

diameter at breast height (dbh): A tree's diameter measured at about 4.5 feet (1.37m) above the forest floor on the uphill side of the tree. For the purposes of determining breast height, the forest floor includes the duff layer that may be present, but does not include unincorporated woody debris that may rise above the ground line.

diameter class: Any of the intervals into which a range of diameters of tree stems may be divided for classification and use, (e.g., 10-inch class includes diameters from 9.5 inches to 10.49 inches.

dispersed recreation: Recreation opportunities or use occurring in the general forest area. Does not take place in developed sites. Examples are trail use, rock climbing, boating, hunting and fishing.

disturbance (ecology): A discrete event, either natural or human-induced, that causes a change in the existing condition of an ecosystem.

disturbance-recovery regime: A natural pattern of periodic disturbance followed by a period of recovery. Examples include fire or flooding.

diversity: The distribution and abundance of different plant and animal communities and species within the area covered by a land and resource management plan.

drainage area/basin: The total area above a given point on a stream that contributes to the flow at that point. Term is often used interchangeably with watershed.

drumming log: Drumming logs are large, decaying logs generally used by male ruffed grouse for display purposes. They usually have large overhanging shrub cover. Many of the same drumming locations are used year after year, often by the same male. Drumming centers have a zone of influence of about 20 acres that are usually defended.

E

early successional forest: Defined as regenerating forest of 0 to 35 years of age for depending upon the ecological system. It is characterized by dominance of woody growth of regenerating trees and shrubs, often with a significant grass/forb component, and relatively low density or absent overstory. This condition is distinguished from most permanent opening habitats by dominance of relatively dense woody vegetation, as opposed to dominance of grasses and forbs. Such conditions may be created by even-aged and two-aged regeneration cutting, and by natural disturbance events, such as windstorms, severe wildland fire, and some insect or disease outbreaks. Ages defining the remaining successional stages vary by ecological system.

ecological classification system: A hierarchical system used to help organize and coordinate the classification of ecological types, units, and to make comparisons. Classification is ecologically based and integrates existing resource data including climate, topography, geology, soil, hydrology, and vegetation. The system includes many levels (from the top-down approach): domain, division, province, section, subsection, land type, land type association, land type phase, and site.

ecological management unit: A grouping of one or more soil series that have similar characteristics including texture, structure, or water retention capacity. EMUs are used in soil mapping.

ecological process: The actions or events that link organisms (including humans) and their environment such as disturbance, successional development, nutrient cycling, carbon sequestration, productivity, and decay.

ecosystem: A complete interacting system of organisms and their environment.

ecosystem/cover type: The native vegetation ecological community considered together with non-living factors of the environment as a unit. The general cover type occupying the greatest percent of the stand location. Based on tree or plant species forming a plurality of the stocking within the stand. May be observed in the field, or computed from plot measurements.

ecosystem management: An ecological approach to natural resource management to assure productive, healthy ecosystem by blending social, economic, physical and biological needs and values.

ecotone: An ecological community of mixed vegetation formed by the overlapping of adjoining communities.

edaphic: pertaining to soil or geologic conditions

edge effects: Ecological characteristics associated with the junction between two dissimilar habitat types or successional stages that positively or negatively affect species living there.

endangered species: Any species that is in danger of extinction throughout all or a significant portion of its

range, other than members of the class Insecta determined by the Secretary of Interior to constitute a pest whose protection under the provisions of this (Endangered Species Act of 1973) act would present an overwhelming and overriding risk to humans. It must be designated in the *Federal Register* by the appropriate secretary.

endemic: Species restricted to a particular geographic area. Usually limited to one or a few small streams or a single drainage.

ending inventory: The standing volume at the end of the planning horizon. It must be adequate for the maintenance of long-term sustained yield.

environment: All the conditions, circumstances, and influences surrounding and affecting the development of an organism, or group of organisms.

environmental consequence: The result or effect of an action upon the environment.

environmental impact statement: A disclosure document revealing the environmental effects of a proposed action, which is required for major federal actions under Section 102 of the National Environmental Policy Act, and released to the public and other agencies for comment and review. Final Environmental Impact Statement (FEIS) is the final version of the statement disclosing environmental effects required for major federal actions under Section 102 of the National Environmental Policy Act.

environmental impact: Used interchangeably with environmental consequence or effect.

ephemeral streams: Streams having flows that occur for short periods of time in direct response to storm precipitation or snowmelt runoff. Their bottoms are always above the water table and do not contain fish or aquatic insects that have larvae with multiple-year life cycles. Ephemeral streams may have a defined channel, but may be manifested as a natural swale or depression with vegetation and organic material covering the bottom. They also may serve as a conduit for much of the sediment that enters the stream system. Large woody debris associated with ephemeral streams may also contribute significantly to the stability of a stream system. Ephemeral streams that exhibit an ordinary high watermark, show signs of annual scour or sediment transport, are considered navigable waters of the United States.

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.

eutrophication: Condition of a lake where deleterious effects are caused by increased nutrients (nitrogen and phosphorous), and a decrease in oxygen.

evapotranspiration: The transfer of water vapor to the atmosphere from soil and water surfaces (evaporation) and from living plant cells (transpiration).

even-aged silvicultural system: A planned sequence of treatments designed to maintain and regenerate a stand with one age class.

even-aged stand: A stand of trees containing a single age class in which the range of tree ages is usually less than 20 percent of rotation.

existing old growth: forest stands or patches that have been determined to meet the age, disturbance, basal area and tree size criteria described in the operational definitions for the 16 forest community types of the Southern Region (see *Guidance for Conserving and Restoring Old Growth Forest Communities on National Forests in the Southern Region, Forestry Report R8-FR 62, 1997).* A stand or patch must meet all four criteria in order to be classified as existing old growth.

existing wilderness: Those areas already designated as wilderness by Congress.

extirpation: Extinction of a species from a part of its range.

F

facilities level: A term that refers to campgrounds, expressed as Development Level 1-5. Customers in levels 1 and 2 campgrounds generally seek a relatively primitive experience with a minimum of facilities for comfort or convenience. Tent camping dominates and spurs are too short to accommodate most RVs. Utilities are not provided and access is difficult. Level 3 developments focus on tent campers and small RVs. Low amperage electrical service may be provided. Water hydrants and flush toilets are typically provided. A moderate degree of accessibility is provided. Level 4 and 5 developments serve users with RVs of all types. Showers, flush toilets and other amenities are available; individual water, sewer and electrical hookups are commonly provided.

facility: A single or contiguous group of improvements that exists to shelter or support Forest Service Programs. The term may be used in either a broad or narrow context; for example, a facility may be a ranger station compound, lookout tower, leased office, work center, separate housing area, visitor center, research laboratory, recreation complex, utility system, or telecommunications site".

feathering: A treatment used along the edges of openings in the forest canopy to reduce shadow contrasts by manipulating the density and size of vegetation.

Federal Register*:* The designated document that notifies the public of federal actions and includes Notice of Intent, calls for public involvement, etc. It also publishes the regulations needed to implement those federal actions.

federally listed: Any plant or animal species listed as threatened or endangered under the Endangered Species Act.

Federally Listed Threatened and Endangered Mussel and Fish Conservation Plan: The George Washington and Jefferson National Forests worked closely with the U.S. Fish and Wildlife Service in 2004 to develop the Federally Listed Threatened and Endangered Mussel and Fish Conservation Plan for both forests. The conservation plan included the life history, threats, conservation needs and specific conservation measures for federally listed mussel and fish species that have potential to be affected by forest activities.

felling: The cutting down of trees.

final crop: That portion of the growing stock (to be) kept until final commercial harvest, (i.e., final product objective).

fire dependent species: refers to species that depend on fire occurrence to maintain habitat characteristics or life cycle requirements (opening cones to disperse seeds).

fire adapted species: refers to species that have adapted to fire occurrence and whose populations are enhanced through a particular fire regime.

fire regime condition class (FRCC): Based on coarse scale national data, classes measure general wildfire risk:

> **Condition Class I:** Fire regimes are usually within historical ranges. Vegetation composition and structure are intact. The risk of losing key ecosystem components from the occurrence of fire is relatively low.
>
> **Condition Class II:** Fire regimes on these lands have been moderately altered from their historical range by increased or decreased fire frequency. A moderate risk of losing key ecosystem components has been identified.

Condition Class III: Fire regimes on these lands have been significantly altered from their historical return interval. The risk of losing key ecosystem components from fire is high. Fire frequencies have departed from historical ranges by multiple return intervals. Vegetation composition, structure and diversity have been significantly altered.

fire management effectiveness index: A measure of the effectiveness of annual fire management operational programs. Measured in dollars per thousand acres protected, the objective is to minimize the index value.

fire management plan: Strategic plans that define a program to manage wildland fires based on an area's approved land management plan. They must address a full range of fire management activities that support ecosystem sustainability, values to be protected, protection of firefighter and public safety, public health and environmental issues, and must be consistent with resource management objectives and activities of the area.

fire regime: A generalized description of the role a fire plays in the ecosystem. It is characterized by fire frequency, predictability, seasonality, intensity, duration, scale (patch size), and regularity or variability. Five combinations of fire frequency exist.

fire use: The combination of wildland fire use and prescribed fire application to meet resource objectives.

fisheries classification: Water bodies and streams classed as having a cold: or warm-water fishery. This designation is dependent upon the dominant species of fish occupying the water.

fisheries habitat: Streams, lakes, and reservoirs that support fish.

floodplains: Lowland or relatively flat areas joining inland and coastal water including, at a minimum, that area subject to a 1-percent (100-year return period) or greater chance of flooding in any given year. Although floodplains and wetlands fall within the riparian area, they are defined here separately as described in the Forest Service Manual.

formal consultation: A process between US Fish and Wildlife Service and a federal agency that: 1) determines whether a proposed federal action is likely to jeopardize the continued existence of listed species or destroy or adversely modify designated critical habitat; 2) begins with a federal agency's written request and submittal of a complete initiation package; and 3) concludes with the issuance of a biological opinion and, if needed, incidental take statement.

forage: All browse and non-woody plants that are available to livestock or game animals used for grazing or harvested for feeding.

forage production: The weight of forage that is produced within a designated period of time on a given area. The weight may be expressed as green, air dry, or oven dry. The term may also be modified as to time of production including annual, current years, or seasonal forage production.

foreground: The area between the viewer and the middle ground in a landscape; generally from 0 to 1/2 mile distance.

forest road: A road wholly or partly within, or adjacent to, and serving a part of the National Forest System. It also has been included in the Forest Development Road System Plan.

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 use. Lands developed for non-forest use including areas for crops, improved pasture, residential, or administrative areas, improved roads of any width, adjoining road clearing, and power line clearing of any width.

Forest and Rangeland Renewable Resources Planning Act of 1974: An act of Congress requiring the preparation of a program for the management of the national forests' renewable resources, and of land and resource management plans for units of the National Forest System. It also requires a continuing inventory of all National Forest System lands and renewable resources.

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 trail system: Trails that are part of the forest transportation system. A designated path commonly used and maintained for hikers, horse riders, bicycles, or two-wheeled motorized vehicles.

forest type: A descriptive term used to group stands of similar composition and development because of given ecological factors, by which they may be differentiated from other groups of stands.

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.

forestwide standard: A performance criterion indicating acceptable norms, specification, or quality that actions must meet to maintain the minimum considerations for a particular resource. This type of standard applies to all areas of the forest regardless of the other management prescriptions applied.

four-wheel drive vehicle (4WD): A full-sized vehicle with four-wheel drive, which is registered with the state, and legal to operate on public highways. Any Sport Utility Vehicle would fall in this class, although a 4WD may be a modified vehicle intended primarily for off-highway use.

free-to-grow: A seedling or small tree free from direct competition from other trees, shrubs, grasses, or herbaceous plants.

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 loading: The amount of fuel (flammable natural materials) expressed quantitatively in terms of weight of fuel per unit area.

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.

fuelwood: Wood used for conversion to some form of energy.

future old growth: stands or patches that may, or may not, currently meet the operational definition for existing old growth, but are allocated to management prescription areas that will not allow timber harvest and thus allow the stands to mature to become old growth.

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.

general forest area: (New term for dispersed recreation) – Describes areas where recreation occurs outside of developed areas. Dispersed recreation is typically associated with low-density use distributed over large expanses of land.

geologic features: Landforms or other features of significant geologic interest that may require special management to protect the special qualities, or provide interpretation to the public.

geologic formation: A mappable body of rock identified by distinctive characteristics, some degree of internal homogeneity, and stratigraphic position. The name normally consists of two parts. The first is the name of the geographic locality where the formation was first identified and described. This is followed by a descriptive geologic term, usually the dominant rock type.

Geographic Information System (GIS): 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.

goal: In planning, a concise statement that describes a desired future condition to be achieved with no specific date by which it is to be attained. It is normally expressed in broad, general terms. Goal statements form the principal basis from which objectives are derived.

grassland: Areas on which vegetation is dominated by grasses, grass-like plants, forbs, and/or cryptogams (mosses, lichens, and ferns), provided these areas do not qualify as built-up land or cultivated cropland. Examples include tall grass and short grass prairies, meadows, cordgrass marshes, sphagnum moss areas, pasturelands, and areas cut for hay.

grazing: Consumption of range or pasture forage by animals.

grazing capacity: The maximum stocking rate possible without inducing damage to vegetation or related resources.

grazing permit: Official, written permission to graze a specified number, kind, and class of livestock for a specific period on a defined range allotment.

gross receipts: A total of all funds received by the U.S. Treasury as a result of Forest Service activities.

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.

groundwater-dependent ecosystems (GDEs): communities of plants, animals, and other organisms whose extent and life processes are dependent on access to or discharge of ground water. Includes areas such as springs, seeps and wetlands; groundwater-fed streams/lakes and associated riparian areas; shallow water table areas; cave and karst systems.

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.

growing stock trees: Live trees, meeting specified standards of quality or vigor, included in growth and yield projections to arrive at the allowable sale quantity.

growing stock volume: Volume (cubic feet) of solid wood in growing stock trees 5 inches DBH and larger, from a 1-foot stump to a minimum 4-inch top diameter, outside bark, on the central stem. Volume of solid wood in primary forks from the point of occurrence to a minimum 4-inch top diameter outside bark is included.

guideline: A preferred or advisable course of action generally expected to be carried out. Guidelines can also describe limitations on management actions, but they are generally not as restrictive as standards. Guidelines often indicate measures that should be taken to help maintain or restore resource conditions, or prevent resource degradation. Deviation from compliance does not require a Forest Plan amendment, but rationale for deviation is required in the project record or NEPA documentation for a signed decision.

H

habitat: The native environment of an animal or plant in which all the essentials for its development, existence, and reproduction are present.

harvest cutting: An intermediate or final cutting that extracts salable trees.

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.

heritage sites and assets: Remnants of past cultures that remind us of the centuries-old relationship between people and the land (from *National Heritage Strategy*); property, plant or equipment that are unique for one or more of the following reasons: (1) historical or natural significance; (2) cultural, educational or artistic/aesthetic significance; or (3) significant architectural characteristics.

hibernaculum (plural is hibernacula): A wintering area (usually underground) for bats (caves, rockshelters, mines). Typically, hibernacula provide a cold but not freezing temperature and relative high humidity. Different bat species have different environment requirements for their hibernacula.

high risk soils: Soils very susceptible to nutrient depletion and acidification caused by acid precipitation and/or vegetation management. This is caused by low buffering capability in the soil to the effects of these impacts. Factors contributing to low buffering capability are low organic matter, siliceous and acidic geology, low clay content, shallow depth to bedrock (rooting depth) and low natural fertility.

historic landscapes: Industrial, agricultural, pastoral or domestic landscapes that have evolved over many years from human alteration. Commonly functional and often vernacular, the landscapes may not always be visually pleasing, often responding to specific functions or topography, not formally planned or designed. They may be informal to the degree that they appear to be natural occurrences, or the spatial organization of built and natural elements may be quite traditional or formal. They are identifiable and can be mapped, either as point-specific features or enclaves within a larger landscape, as entire landscapes themselves, or as a combination of both.

historic range of variability: The range of the spatial, structural, compositional, and temporal characteristics of ecosystem elements during a period specified to represent "natural" conditions.

horizontal drilling: a method of drilling a well for the production of natural gas or oil that is intended to maximize the length of wellbore that is exposed to the formation and in which the wellbore is initially vertical but is eventually curved to become horizontal, or nearly horizontal, to parallel a particular geologic formation. (Modified from West Virginia Legislature 2011 Natural Gas Horizontal Well Control Act "Horizontal Well Control Act" in Enrolled house Bill 401, passed December 14, 2011.) (http://www.legis.state.wv.us/Bill_Status/bills_text.cfm?billdoc=hb401enr.htm&yr=2011&sesstype=4X&i=401; accessed June 12, 2012).

hydraulic fracturing: a well stimulation process of injecting pressurized fluids into the subsurface to initiate or propagate fractures in rock (target geologic formations) to enhance production of natural gas and/or oil. The type, composition and volume of fluids used depend largely on regional geologic structure, formation pressure and the specific geologic formation and target for a well.

hydraulic fracturing fluid: the primary carrier fluid and all applicable additives. Sand pumped in with the fluids helps to keep the fractures open.

hydric soils: Soils developed in conditions where soil oxygen is limited by the presence of saturated soil for long periods during the growing season.

Hydrologic Unit Code (HUC): A cataloging system developed by the US Geological Survey and the Natural Resource Conservation Service to identify watersheds, and to standardize hydrological unit delineations for geographic description and data storage purposes.

I

igneous: Rocks derived by solidification of magma or molten lava emplaced on or below the earth's surface.

immediate foreground: The area in the landscape from the viewer out to 300 feet distance.

impaired stream: Waters are defined by the Virginia Department of Environmental Quality as impaired when they do not support, or only partially support, one or more of five designated uses, (i.e. aquatic life, fish consumption, shellfish consumption, swimming, and drinking water). Support of the designated uses is based on compliance with Virginia's Water Quality Standards which include numeric and narrative criteria. Compliance is determined by the assessment of all available monitoring data and water quality information.

improved pasture: Fenced, fertilized pastures intensively managed for livestock grazing.

improvement cutting: The removal of less desirable trees in a stand of poles or larger trees, primarily to improve composition and quality.

incidental take: Take of ESA-listed fish of wildlife species that results from, but is not the purpose of, carrying out an otherwise lawful activity conducted by a federal agency or applicant.

incidental take statement: The document that recognizes the circumstances of and level of incidental take, the reasonable and prudent measures required to further minimize the level of incidental take, and the terms and conditions the Forest must comply with to implement the reasonable and prudent measures.

indicator: a measurement of an ecological condition to evaluate progress made toward goals and objectives.

informal consultation: An optional process that includes all discussions and correspondence between the US Fish and Wildlife Service and a federal agency prior to formal consultation, to determine whether a proposed federal action may affect listed species or critical habitat. This process allows the federal agency to utilize the US Fish and Wildlife Service's expertise to evaluate the agency's assessment of potential effects or to suggest possible modifications to the proposed action that could avoid potentially adverse effects.

industrial wood: All commercial round wood products, except fuelwood.

infestation: The attack by macroscopic organisms in considerable concentration. Examples are infestations of tree crowns by gypsy moth, timber by termites, soil or other substrates by nematodes or weeds.

INFRA: An integrated database for collection/storage/use of information about features, land units, facilities and utilities, accessibility and real property. For recreation management, INFRA holds information on O&M costs, recreation funding shortfalls, recreation use data, information on accessibility, and inventories of facilities. INFRA brings together Oracle, Arc Info and Arc View GIS technology, and supplements recreation management systems including SMS, ROS and Benefits Based Management.

initial attack: The aggressive response to a wildland fire based on values to be protected, benefits of response, and reasonable cost of response.

instream 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 (IPM): The maintenance of destructive agents, including insects at tolerable levels, by the planned use of a variety of preventive, suppressive, or regulatory tactics and strategies that are ecologically and economically efficient and socially acceptable.

interdisciplinary team: A group of individuals with skills for management of different resources (e.g.: wildlife biologist, hydrologist, forester, etc.). An interdisciplinary team is assembled because no single scientific discipline is sufficient to adequately identify and resolve issues and problems. Team members ensure integrated use of natural and social sciences as required by the NEPA and NFMA.

interior forest habitat: High canopy forest conditions suitable to meet the requirements of area-sensitive species that are adversely impacted by forest edge, including microclimate change (warmer, windier), increased predation, increased brood parasitism, and increased competition.

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. Types include thinning, release and improvement cuttings.

intermittent streams: Streams that flow in response to a seasonally-fluctuating water table in a well-defined channel. The channel will exhibit signs of annual scour, sediment transport, and other stream channel characteristics, absent perennial flows. Intermittent streams typically flow during times of elevated water table levels, and may be dry during significant periods of the year, depending on precipitation cycles.

interpretive association: A nonprofit, tax-exempt corporation or organization whose purpose is extending and enhancing the ability of the Forest Service to provide customer service to National Forest visitors. They work cooperatively with the Forest Service in educating the public about natural and cultural issues on public lands.

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: A species that can move into an area and become dominant either numerically or in terms of cover, resource use, or other ecological impacts. An invasive species may be native or non-native.

inventoried roadless area: Areas identified in a set of inventoried roadless area maps, contained in Forest Service Roadless Area Conservation, Final Environmental Impact Statement, Volume 2, dated November 2000, or any subsequent update or revision of those maps in accordance with the Roadless Area Conservation Final Rule (the '2001 Roadless Rule'). Reference 36 Code of Federal Regulations, Part 294 and 66 Federal Register 3244-3272 (Jan. 12, 2001). The definition of a roadless area for the 2001 Roadless Rule included: undeveloped areas typically exceeding 5,000 acres that met the minimum criteria for wilderness consideration under the Wilderness Act and that were inventoried during the Forest Service's Roadless Area Review and Evaluation (RARE II) process, subsequent assessments, or forest planning.

irretrievable impact: Refers to commitments that are lost for a period of time. For example, while an area is used as a developed recreation site, some or all of the timber production there is irretrievably lost. If the recreation area closes, timber production could resume. However, the loss of timber production during that time of irretrievability is not irreversible, because it is possible for timber production to resume if the area is no longer used as a recreation site. Contrast with irreversible impact.

irreversible impact: Refers to commitments that cannot be reverse, except perhaps in the extreme long term. For example, once coal has been removed, it will not be replaced within any measurable time period. Contrast with irretrievable impact.

K

karstland: Land underlain by limestone and characterized by sinks, abrupt ridges, irregular rock outcrops, caverns and underground streams.

L

land acquisition: Obtaining full landownership rights by donation, purchase, exchange, or condemnation.

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.

land management planning: A formal process of management planning involving four interactive steps: monitoring, assessment, decision making, and implementations as described in the Federal Code of Regulations.

LANDFIRE: LANDFIRE (also known as Landscape Fire and Resource Management Planning Tools) is an interagency vegetation, fire, and fuel characteristics mapping program, sponsored by the United States Department of the Interior (DOI) and the United States Department of Agriculture, Forest Service. LANDFIRE produces a comprehensive, consistent, scientifically credible suite of spatial data layers for the entire United States. LANDFIRE data products consist of over 50 spatial data layers in the form of maps and other data that support a range of land management analysis and modeling. Specific data layer products include: Existing Vegetation Type, Canopy, and Height; Biophysical Settings; Environmental Site Potential; Fire Behavior Fuel Models; Fire Regime Classes; and Fire Effects layers. The original LANDFIRE Project was designed to use peer-reviewed, consistent, and repeatable scientific methods. Data products are developed through integrating a collection of advanced scientific procedures, including relational databases, georeferenced land-based plots and polygons representing field conditions, satellite-enabled remote sensing, systems ecology, gradient analysis, predictive landscape modeling, and vegetation and disturbance dynamics. (www.landfire.gov)

landscape: An area composed of interacting ecosystems that are repeated because of geology, land form, soils, climate, biota, and human influences throughout the area. Landscapes are generally of a size, shape, and pattern that are determined by interacting ecosystems.

landscape character: Particular attributes, qualities, and traits of a landscape that give it an image and make it more identifiable or unique. Levels include Natural Evolving, Natural Appearing, Pastoral/Agricultural, Historic, Transitional, Suburban, and Urban.

landscape theme: The general focus or subject of variations on landscape character settings. Detailed description of desired landscape character. Themes range from a natural landscape to an urban landscape.

landtype: An intermediate level in the ecological classification system hierarchy that addresses land areas ranging in size from hundreds of acres up to ten thousands of acres. These units typically have similarities in landform, natural vegetative communities, and soils.

landtype association: A group of landtypes. The landtypes in the association are sufficiently homogeneous to be considered as a whole for modeling the future outputs and effects of planned management activities.

Landtype associations may not follow watershed boundaries, and are defined on the basis of general similarities in climate, geology, landform, and vegetation.

landtype phase: The most detailed level in the ecological classification system hierarchy that addresses local geology, soils, streams, and vegetation types. Land areas are generally less than 100 acres in size.

landslide: A general term for a mass movement landform. Types of landslides include creep, rock slides and falls, earthflows, debris flows, and avalanches.

large woody debris (LWD): Any piece(s) of dead woody material, e.g., dead boles, limbs, and large root masses, on the ground in forest stands, or in streams. Sometimes called coarse woody debris (CWD).

late successional forest: forests from 50 to 100 years in age and older, include old growth conditions. This stage contains the largest trees and often has well-developed canopy layers and scattered openings caused by tree mortality.

late successional closed canopy: Stands reaching older ages of mature trees (50-100 years or greater) and more lasting structural conditions with a largely closed canopy (all layers) greater than 60%. Includes natural canopy gaps.

late successional open canopy: Stands reaching older ages of mature trees (50-100 years or greater) and more lasting structural conditions with overall open canopy (canopy closure of 25-60%; typical of thinned forests).

leaching: The gravity influenced loss of water-soluble plant nutrients from the soil.

leasable minerals: See minerals (leasable).

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.

leave tree: A tree (marked to be) left standing for wildlife, seed production, etc., in an area where it might otherwise be felled.

limits of acceptable change (LAC): A system in which the amount of change to be allowed is defined explicitly by means of quantitative standards and the appropriate management actions needed to prevent further change are identified, and procedures for monitoring and evaluating performances are established.

locally rare species: A term used by USDA Forest Service to describe species for which representation on a particular forest is a concern.

logging: The felling, skidding, on-site processing, and loading of trees or logs onto trucks.

long-term sustained-yield capacity: The highest uniform wood yield from lands being managed for timber production that may be sustained under a specified management intensity, consistent with multiple-use objectives. (36 CFR 219.3, 1982 rule)

low PSI skidder: A term used to identify any one of several types of vehicles used to move logs from stump to log loading area. Low PSI (pounds per square inch) identifies those vehicles that, because of design of tracks, wheels, or suspension system, exert much lower pressure on ground surface than other types of ground-based skidding vehicles.

M

Major Land Resource Area: Major land resource area (MLRA) boundaries are based on soil and landscape characteristics, vegetation, and climate. MLRAs often include a wide range of soil, plant, and landscape conditions.

management action: A set of management activities applied to a land area to produce a desired output.

management area: A Forest Planning term denoting a contiguous geographic area of land with similar physical, biological, or social factors which influence management decisions. Each management area is allocated to one or more management prescriptions.

Management Attainment Report (MAR): A process used in determining whether work is progressing as planned. It provides the manager with information for measuring progress against objectives, information for measuring self and subordinates' performance, and an indication of a reporting unit's performance.

management direction: A statement of multiple-use goals, objectives, and standards for attaining them. Management direction is expressed forestwide, by management prescription, and by management area.

management emphasis: The multiple-use values to be featured or enhanced within a given management prescription or management area.

management indicator species (MIS): An animal or plant selected for use as a planning tool in accordance with 1982 NFMA regulations (36 CFR 219.19). These species are used to help set objectives, analyze effects of alternatives, and monitor Forest Plan implementation. They are chosen because their population changes are believed to indicate the effects of management on selected biological components.

management intensity: A management practice or combination of management practices and associated costs designed to obtain different levels of goods and services.

management practice: A specific action, measure, course of action, or treatment undertaken on a forest.

management prescription area: A Forest Planning term denoting areas of land with similar desired conditions, objectives, and standards for achieving them. Management practices and intensity are selected and scheduled for implementation to attain multiple-use goals and objectives.

management type: The tree species or species group that should be grown on a specific site, whether or not it presently occupies the site that best suits the particular site soil, aspect, elevation, and moisture provided by the area and the forest plan's objectives.

manual site preparation: The killing or retardation of competing vegetation to prepare for an area for reforestation, using hand or power tools such as chainsaws.

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.

maternity colony (for Indiana bats): A group of female Indiana bats that day-roost together during the spring and summer maternity season, generally in one or more snags or living trees. Young are born and reared while the female bats are gathered in a maternity colony.

maximum modification: A visual quality objective in which human activities may dominate the characteristic landscape, but should appear as a natural occurrence when viewed as background.

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.

mean annual soil temperature: The average yearly temperature of the soil at 20 inches for a given area.

meaningful measures: A moniker for the Forest Service's National Recreation Business Management System, MM is a six-step management system for professional, accountable and visitor-responsive site and project-level management. Accomplishment is measured by established standards of quality for recreation services; the system determines costs to attain those standards, sets priorities for work to be accomplished and budget allocations, and measures the actual success at attaining these quality standards.

mechanized transport: Any contrivance for moving people or material in or over land, water, or air, having moving parts, that provides a mechanical advantage to the user, and that is powered by a living or nonliving power source. This includes, but is not limited to, sailboats, hang gliders, parachutes, bicycles, game carriers, carts, and wagons. It does not include wheelchairs when used as necessary medical appliances. It also does not include skis, snowshoes, rafts, canoes, sleds, travois, or similar primitive devices without moving parts.

mesic: Sites or habitats characterized by intermediate moisture conditions, i.e., neither decidedly wet or dry.

metamorphic: Rocks altered considerably from their original structure and mineralogy by pressure and heat.

middle ground: The space between the foreground and the background in a picture or landscape; generally 1/2 mile to 4 miles distance from the viewer.

mid-successional forest: often begins to develop with the sapling/pole forest characterized by canopy closure of dense tree regeneration, with tree diameters typically smaller than 10 inches. It then proceeds through stratification of over-, mid-, and understory layers.

mid-successional closed canopy: Stands beyond regeneration where the canopy closure is greater than 60%.

mid-successional open canopy: Stands beyond regeneration that stay in a relatively open canopy (canopy closure of 25-60%).

mineral exploration: The search for valuable minerals on lands open to mineral entry.

mineral materials: Materials such as road aggregate, landscaping rock, rip-rap, and other earthen construction materials. These materials are used to build and maintain trails, roads, and campgrounds; to restore riparian and aquatic habitat; to repair flood damage, etc.

mineral soil: Weathered rock materials without any vegetative cover.

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): Coal, oil, gas, phosphate, sodium, potassium, oil shale, sulphur, and geothermal steam. All hard-rock minerals that occur on acquired lands, as opposed to public domain lands, are leasable.

minimum management requirement: Any constraint imposed to comply with 36 CFR 219.27 and other legal restrictions that must be met by benchmark solutions as noted in 36 CFR 219.11(e)(1). These include requirements including conserving soil productivity, maintaining minimum viable populations of wildlife, preserving the habitat of endangered species' habitat, dispersing openings, and limiting cut size. It also includes any other standards and guidelines, including best management practices that serve to define management prescriptions and resource response.

mitigation: Actions to avoid, minimize, reduce, eliminate, or rectify the impact of a management practice.

mixed mesophytic forest: A forest containing tree (mostly hardwood) and plant species, which normally grow in moderately moist soils, typically in coves, or in riparian areas.

modification: A visual quality objective in which human activity may dominate the characteristic landscape but must, at the same time, use naturally established form, line, color, and texture appearing as a natural occurrence when viewed in foreground or middle ground.

monitoring: The periodic evaluation on a sample basis of Forest Plan management practices to determine how fully objectives have been met, how closely management standards have been applied, and what effects those practices had on the land and environment.

montane: Relating to the zone of relatively moist, cool upland slopes characterized by the presence of large evergreen trees as a dominant life form.

mortality: Dead or dying trees resulting from forest fire, insect, diseases, or climatic factors.

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

motorized equipment: Machines that use a motor, engine, or other nonliving power sources. This includes, but is not limited to, such machines as chain saws, aircraft, snowmobiles, generators, motor boats, and motor vehicles. It does not include small battery or gas powered hand carried devices such as shavers, wristwatches, flashlights, cameras, stoves, or other similar small equipment. There is a variation of this issue which involves personal use of cell phones, satellite phones, walkie-talkies, portable music players, and a variety of other electronic devices which can distract from the wilderness experience of others. These items, considered 'personal use' items, are not prohibited by law or agency policy, even if they contain small motors.

multiple use: The management of all the various renewable surface resources of the National Forest System so that they are used in a manner that will best meet the needs of the American people. Making the most judicious use of the land for these resources or related services over areas large enough to provide sufficient latitude for periodic adjustments in the use to conform to changing needs and conditions; that some lands 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 (36 CFR 219.3, 1982)

N

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 System (NFS): All national forest lands reserved or withdrawn from public domain of the United States and acquired through purchase, exchange, donation, and/or other means. National Grasslands and land utilization projects administered under Title III of the Bankhead–Jones Farm Tenant Act (50 Stat. 525, 7 U.S.C. 1010–1012), and other lands, waters, or interests that are administered by the Forest Service, or are designated for administration through the Forest Service as a part of the system.

National Forest System Land: Federal land that has been legally designated as national forests or purchase units, and other land under the administration of the Forest Service, including experimental areas and Bankhead-Jones Title III land.

National Historic Landmark: Cultural properties designated by the Secretary of the Interior as being nationally significant. These cultural properties may be buildings, historic districts, structures, sites and objects

that possess exceptional value in commemorating or illustrating the history of the United States.

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 archaeological resources. Properties listed in the National Register include districts, sites, buildings, structures, and objects that are significant in American history, architecture, archaeology, engineering and culture. The National Register is administered by the National Park Service, which is part of the US Department of the Interior.

National Visitor Use Monitoring: A systematic process to estimate al 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.

National Visitor Use Monitoring (NVUM): A systematic process to estimate annual recreation and other uses of National Forest lands through user surveys.

natural appearing landscape character: Landscape character that has resulted from human activities, yet appears natural.

natural range of variability: In planning, the full range of ecosystem processes and disturbance regimes that occur within the current climatic period.

net annual growth: The net change in merchantable volume expressed as an annual average between surveys in the absence of cutting (gross growth minus mortality).

net public benefits: An expression used to signify the overall long-term value to the nation of all outputs and positive effects (benefits) less all associated inputs and negative effects (costs) whether they can be quantitatively valued. Net public benefits are measured by quantitative and qualitative criteria rather than a single measure or index. The maximization of net public benefits to be derived from management of units of the National Forest System is consistent with the principles of multiple use and sustained yield.

no-action alternative: The most likely condition expected to exist in the future if current management direction would continue unchanged.

no surface occupancy (NSO): Use or occupancy of the land surface for fluid mineral exploration or development is prohibited to protect the identified resource values.

non-attainment area: For National Ambient Air Quality Standards (NAAQS), where the pattern of "violations of standard" is sufficient to require remedial action; a boundary is determined around the location of the violations. The area within that boundary is designated to be in non-attainment of the particular NAAQS standard and an enforceable plan is developed to prevent additional violations.

non-chargeable volume: All volume not included in the growth and yield projections for the selected management prescriptions used to arrive at the allowable sale quantity.

non-commercial thinning: The thinning of commercial-size trees without a subsequent sale of associated wood products. Also called a pre-commercial thinning.

non-commodity output: A resource output that cannot be bought and sold.

non-declining yield: A level of timber production planned so that the planned sale and harvest for any future decade is equal to or greater than the planned sale and harvest for the preceding decade.

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-game species: Any species of wildlife or fish which is ordinarily not managed or otherwise controlled by hunting, fishing, or trapping regulations. The designation may vary by state.

non-native invasive species: A species that did not originate in the location it is living and has no natural predators or disease to keep it in check. As a result, it can out-compete other species for space, food, and water, negatively affecting native populations of species.

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-stocked stands: Stands less than 16.7 percent stocked with growing stock trees.

non-timber forest products: All forest products except timber, including resins, oils, leaves, bark, plants other than trees, fungi, and animals or animal products.

nutrient cycling: A pathway by which a chemical element or molecule moves through both biotic (biosphere) and abiotic (lithosphere, atmosphere, and hydrosphere) compartments of Earth. In effect, the element is recycled, although in some cycles there may be places (called *reservoirs*) where the element is accumulated or held for a long period of time (such as an ocean or lake for water).

O

objective: A concise, time-specific statement of measurable planned results that respond to pre-established goals. It forms the basis for further planning to define the precise steps to be taken and the resources to be used in achieving identified goals.

off-highway vehicle (OHV): Any motor vehicle designed for or capable of cross-country travel on or immediately over land, water, sand, snow, ice, wetland, or other natural terrain. OHVs include all-terrain vehicles (ATV), motorcycles, amphibious machines, snowmobiles, hovercraft, and any other vehicles that use mechanical power, including 2 and 4-wheel drive (4WD) vehicles that are highway registered, when operated off highways.

offstream use: Water withdrawn or diverted from a ground or surface-water source for public water supply, industry, irrigation, livestock, thermoelectric power generation, and other uses.

old field: Idle or abandoned farmland or pasture that is reverting to shrubland or forest.

old growth: Defined by age (can vary by forest type) and related structure attributes as defined in the *Guidance for Conserving and Restoring Old-Growth Forest Communities on National Forests in the Southern Region, Forestry Report R8-FR 62*, 1997. Criteria include: 1) a minimum age at which a stand will begin to develop old growth conditions; 2) presence of past disturbance; 3) basal area; and 4) tree size for the largest trees.

on-site: A term referring to species normally found on a site under natural conditions. The same or contiguous property that may be divided by a public or private right-of-way, provided that the entrance and exit between the properties is at a crossroads intersection, and that access is by crossing, as opposed to going along the right-of-way.

open structural condition: Land with less than 10% canopy cover in permanent or long-term open condition (grasslands, barrens, etc.; not newly cut forest regeneration).

open woodlands: Created and maintained largely by periodic fire disturbance regimes, open woodlands are characterized by an overstory of trees that are spaced far enough apart to allow sunlight to reach the forest floor. This structural condition allows the development of a grassy/shrubby/herbaceous/woody understory more typical of early successional forest and grassland/shrublands.

operating plan: A written plan, prepared by those engaged in mining activity on the forests, and approved by a forest officer for prospecting, exploration, or extraction activities that are slated to take place on National Forest System land.

operational maintenance level: Maintenance levels define the level of service provided by, and maintenance required for, a specific road. There are five maintenance levels that are described as follows:

Level 1 - Assigned to intermittent service roads during the time they are closed to vehicular traffic. Closures must be for 1 or more years. Basic custodial maintenance is performed to keep damage to adjacent resources to an acceptable level and to perpetuate the road to facilitate future management activities.

Level 2 - Assigned to roads open for use by high clearance vehicles. Road in this maintenance level are low speed, single lane and native surface.

Level 3 - Assigned to roads open and maintained for travel by a prudent driver in a standard passenger car. User comfort and convenience are not considered priorities. Roads in this maintenance level are typically low speed, single lane with turnouts and spot surfacing. Some roads may be fully surfaced with either native or processed material.

Level 4 - Assigned to roads that provide a moderate degree of user comfort and convenience at moderate travel speeds. Most roads are double lane and aggregate surfaced. However, some roads may be single lane. Some roads may be paved and/or dust abated.

Level 5 - Assigned to roads that provide a high degree of user comfort and convenience. These roads are normally double lane, paved facilities. Some may be aggregate surfaced and dust abated.

ordinary high water mark: The line on the shore established by the fluctuation of water, and is indicated by physical characteristics including a clear, natural line impressed on the bank; shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter, debris, or other appropriate means that consider the characteristics of the surrounding area.

output: The goods, end products, or services that are purchased, consumed, or used directly by people. Goods, services, products, and concerns produced by activities that are measurable and capable of being used to determine the effectiveness of programs and activities in meeting objectives. A broad term for describing any result, product, or service that a process or activity actually produces.

output, minimum level: The amount of an output that will occur regardless of management activity.

outstanding mineral rights: Instances in which the minerals in federally: owned lands were severed prior to the transaction in which government acquired the land. Such rights are not subject to the Secretary of Agriculture's rules and regulations. Removal or extraction of these minerals must be allowed in accordance with the instrument severing the minerals from the surface and under applicable state and local laws and regulations. See also Reserved Mineral Right.

outstandingly remarkable values (ORV): Those scenic, recreational, geological, fish and wildlife, historical, cultural, or other similar values that exist to an outstandingly remarkable degree such that a segment of river qualifies under the Wild and Scenic River Act.

overnight use developed sites (OUDS): National Forest sites with facilities for overnight use, including campgrounds, cabins/fire lookouts, lodges, horse camps, etc. Recreation residences are not included in this definition.

overstory: That portion of trees in a two: or multi-layered forest stand that provides the upper crown cover.

overstory removal: The cutting of trees comprising an upper canopy layer in order to release trees or other vegetation in an understory.

P

parent materials: The underlying geological material (generally bedrock or a superficial or deposit) in which soil horizons form.

partial retention: A visual quality objective which in human activities may be evident, but must remain subordinate to the characteristic landscape.

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: Any watercourse that generally flows most of the year in a well-defined channel and is below the water table. Droughts and other precipitation patterns may influence the actual duration of flow. It contains fish or aquatic insects that have larvae with multi-year life cycles. Water-dependent vegetation is typically associated with perennial streams.

personal use: The use of a forest product, such as firewood, for home use as opposed to commercial use or sale.

persons at one time (PAOT): a measure of carrying capacity, especially for developed sites. National conventions include 5 persons per family picnic/camp unit, 3.5 persons per parking lot stall at a trailhead or visitor center, 1.5 persons per motorcycle parking stall and 40 persons per tour bus parking stall.

person-year: About 2,000 working hours that may be filled by one person working during the course of one year or several people working a total of 2,000 hours.

petrographic: The description and systematic classification of rocks.

physiographic region: A region of similar geologic structure and climate that has had a unified geomorphic history.

planning area: The area of the National Forest System covered by a regional guide or forest plan.

planning criteria: Standards, tests, rules, and guidelines by which the planning process is conducted, and upon which judgments and decisions are based.

planning horizon: The overall time period considered in the planning process that spans all activities covered in the analysis or plan. All future conditions and effects of proposed actions which would influence the planning decisions.

planning period: One decade. The time interval within the planning horizon that is used to show incremental changes in yields, costs, effects, and benefits.

possible old growth: areas with the highest probability of being existing or future old growth based on the preliminary inventory criteria. For the GWNF, these are forest stands that meet the stand age, which varies by forest type) based on current FSVEG data.

potential natural vegetation: the biotic community that would become established if all successional sequences were completed without additional human interference under the present environmental conditions. Classifications of Potential Natural Vegetation are based on existing vegetation, successional relationships, and environmental factors (e.g., climate, geology, soil, natural disturbances, etc.) considered together.

potential wilderness area: An area of national forest system land that meets the criteria for being evaluated for wilderness suitability and possible recommendation to Congress for wilderness study. Reference 72 Federal Register 4478-4481 (Jan. 31, 2007) and Forest Service Handbook 1909.12-2007-1, Chapter 70 Wilderness Evaluation. The intent is to identify and evaluate all NFS lands that meet the definition of wilderness in section 2(c) of the 1964 Wilderness Act.

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 ignited by management actions to meet specific objectives including disposal of fuels, and controlling unwanted vegetation. The fires are conducted in accordance with prescribed fire plans, and are also designed to stimulate grasses, forbs, shrubs, or trees for range, wildlife, recreation, or timber management purposes. Any fire ignited by management actions to meet specific objectives. A written, approved prescribed fire plan must exist, and NEPA requirements (where applicable) must be met, prior to ignition.

prescribed fire plan: A written statement defining the objectives to be attained as well as the conditions of temperature, humidity, wind direction and speed, fuel moisture and soil moisture under which a prescribed fire will be allowed to burn.

present net value (PNV): The difference between the discounted value (benefits) of all outputs to which monetary values or established market prices are assigned and the total discounted costs of managing the planning area. Future estimated revenues and costs are 'discounted' to the present by an interest rate that reflects the changing value of a dollar over time. Also called present net worth and net present value.

preservation: A visual quality objective that provides for ecological change only.

presuppression: Activities required in advance of fire occurrence to ensure effective suppression action, including: (1) recruiting and training fire forces, (2) planning and organizing attack methods, (3) procuring and maintaining fire equipment, and (4) maintaining structural improvements necessary for the fire program.

primary trout stream: Streams that contain naturally-reproducing populations of brook, rainbow, and/or brown trout.

primitive road: Roads constructed with no regard for grade control or designed drainage, sometimes by merely repeated driving over an area. These roads are single lane, usually with native surfacing and sometimes passable with four-wheel drive vehicles only, especially in wet weather.

priority watershed: Watershed with sensitive aquatic species, impaired streams and/or public water supplies (listed in Appendix D).

process records: A system that records decisions and activities that result from the process of developing a forest plan, revision, or significant amendment.

proclamation boundary: The boundary contained within the presidential proclamation that established the national forest.

productivity class: A classification of the capacity of a given piece of land for timber growth is expressed in cubic feet per acre a year.

Class I: Lands capable of producing 120 cubic feet or more per acre a year.
Class II: Lands capable of producing 85 to 119 cubic feet per acre a year.
Class III: Lands capable of producing 50 to 84 cubic feet per acre a year.
Class IV: Lands capable of producing 20 to 49 cubic feet per acre a year.

program budget: The schedule of projects and activities to be carried out on the forest for a year for which funds have been appropriated.

program development and budgeting: The process by which activities for the forest are proposed and funded.

project: A work schedule prescribed for a project area to accomplish management prescriptions. An organized effort to achieve an objective identified by location, activities, outputs, effects, time period, and responsibilities for execution.

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 wilderness study area: Areas recommended for wilderness study by the Forest Service but which have yet to be acted on by Congress.

public water supplies: Public water supplies as identified by the Commonwealth of Virginia (State Water Control Board 9 VAC 25-260-380 Virginia Water Quality Standards. Statutory Authority: 62.1-44.15 3a of the Code of Virginia, effective January 6, 2011). Those within the GWNF include North River, Dry River, Pedlar River, Smith Creek, North Fork of Shenandoah, Cedar Creek, Jackson River, and Coles Run. Known inactive public water supplies are not listed in the Forest Plan.

pulpwood: Wood cut and prepared primarily for manufacture into wood pulp.

R

range allotment: A designated area of land available for livestock grazing upon which a specified number and kind of livestock may be grazed under a range.

range management: The art and science of planning and directing range use to obtain sustained maximum animal production, consistent with perpetuation of the natural resources.

ranger district: Administrative subdivisions of the forest supervised by a District Ranger who reports to the Forest Supervisor.

real dollar value: A monetary value, which compensates for the effects of inflation.

reasonable foreseeable development (RFD) scenario: The prediction of the type and amount of oil and gas activity that would occur in a given area. The prediction is based on geologic factors, past history of drilling, projected demand for oil and gas, and industry interest.

receipt shares: The portion of receipts derived from Forest Service resource management that is distributed to state and county governments, including the Forest Service, 25 percent fund payments.

recommended wilderness study areas: An area of national forest system land that has been evaluated for wilderness suitability, analysis and public review has been completed in accordance with the National Environmental Policy Act, and recommended by the Regional Forester to the Chief, Secretary of Agriculture and the President for further review for Wilderness designation. This recommendation is a preliminary administrative recommendation that will receive further review and possible modification by the Chief of the Forest Service, Secretary of Agriculture and the President of the United States. The Congress has reserved the authority to make final decisions on Wilderness designation.

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 plan: A plan that outlines actions needed to recover and/or protect a federally listed species.

recreation: Leisure time activity including swimming, picnicking, camping, boating, hiking, hunting, and fishing.

Recreation Opportunity Spectrum (ROS): A method for classifying types of recreation experiences available or for specifying recreation experience objectives desired in certain areas. Classes include:

Primitive (P): An area characterized by having essentially unmodified natural environment of 5,000 or more acres. Interaction between users is very low and evidence of other users is minimal. The area is managed to be essentially free from evidence of human-induced restrictions and controls. Motorized use within the area is not permitted. There is a high probability of experiencing isolation from the sights and sounds of humans, independence, closeness to nature, tranquility, and self-reliance through the application of outdoor skills in an environment that offers a high degree of challenge and risk.

Semi-Primitive Non-Motorized (SPNM): Area characterized by a predominantly natural or natural-appearing environment of 2,500 or more acres. Interaction between users is low, but there is often evidence of other users. The area is managed in such a way that minimum on-site controls and restrictions may be present but are subtle. Motorized use is not permitted. There is a moderately high probability of experiencing isolation from the sights and sounds of humans, independence, closeness to nature, tranquility, and self-reliance through the application of woodsman and outdoor skills in an environment that offers challenge and risk.

Semi-Primitive Motorized (SPM): Area characterized by a predominantly natural or natural-appearing environment of 2,500 or more acres, with a moderately high probability of experiencing isolation from the sights and sounds of humans, independence, closeness to nature, tranquility, and self-reliance through the application of woodsman and outdoor skills in an environment that offers challenge and risk. Motorized use is permitted.

Roaded Natural (RN): Area characterized by a predominantly natural or natural-appearing environment with a low probability of experiencing isolation from the sights and sounds of man. Interaction between users may be low to moderate, but with evidence of other users prevalent. Conventional motorized use is provided for in construction standards and design of facilities. Opportunities for both motorized and non-motorized forms of recreation may be provided.

Rural (R): Area characterized by a substantially modified natural environment with a low probability of experiencing isolation from the sights and sounds of man. A considerable number of facilities are designed for use by a large number of people. Facilities for intensified motorized use and parking are provided.

Urban (U): Area characterized by a substantially urbanized environment, although the background may have natural-appearing elements. Vegetative cover is often manicured. Sights and sounds of humans, on-site, are predominant. Facilities for highly intensified motorized use and parking are available with forms of mass transit often available to carry people throughout the site.

Semi-Primitive (SP): Not a true recreation opportunity class, Semi-Primitive is an abbreviated consolidation of both the Semi-Primitive Non-Motorized and Semi-Primitive Motorized classes.

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.

recreation visitor day (RVD): A unit of measure of recreation use equivalent to 12 hours of accumulated recreational activity by one or more persons during one or more visits to the National Forest. For example, 1 person for 12 hours, 2 persons for 6 hours, 3 persons for 4 hours are each one RVD.

reference conditions: Conditions characterizing ecosystem composition, structure and function, and their variability.

reference watersheds: Relatively undisturbed watersheds (listed in Chapter 2) that have existing water quality conditions considered to be representative of the ecological sub-section under natural conditions.

regeneration: The re-establishment of forest cover by seeding, planting, and natural means (also called reforestation). Also used as a noun referring to the young trees themselves.

regeneration cutting: Any removal of trees intended to assist regeneration already present or to make regeneration possible.

regeneration method: Cutting procedure by which a new age class is created. Major methods are clearcutting, seed-tree, shelterwood, selection, and coppice.

regeneration period: The time between the initial regeneration cutting and the successful re-establishment of a new age class by natural means, planting, or direct seeding.

Region 8: The states that make up the Southern Region of the USDA Forest Service.

Regional Forester: The official responsible for management of National Forest land within a USDA Forest Service region.

regulated harvest: Includes any volume scheduled in calculations of the allowable sale quantity which is harvested from suitable forest land.

release and weeding: A silvicultural treatment designed to free desirable trees from competition with overstory trees, less desirable trees, or grasses and other forms of vegetative growth. It includes release of natural and artificial regeneration.

removal cut: The cut which removes the last seed bearers of a seed tree or shelterwood regeneration method after the new seedling stand is considered to be established.

research natural area: An area set aside by the Forest Service specifically to preserve a representative sample of an ecological community, primarily for scientific and educational purposes. Commercial exploitation is not allowed and general public use is discouraged.

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.

residual trees: The live trees remaining after a natural or artificial disturbance (e.g. a wind event or timber harvest).

resiliency: The capacity of forests and grassland/shrublands to return to prior conditions after disturbance. Resilient forests are those that not only accommodate gradual changes related to climate but tend to return

toward a prior condition after disturbance either naturally or with management assistance. Within the GWNF, maintaining a diversity of tree species or dominance types, age or size class diversity within dominance types, and forest density similar to what historic disturbance regimes produced, are considered underpinnings of a resilient forest.

resource: An aspect of human environment which renders possible, or facilitates the satisfaction of, human wants, and the attainment of social objectives.

resource allocation model: A mathematical model using linear programming that will allocate land to prescriptions and schedule implementation of those prescriptions simultaneously. The end purpose of the model is to find a schedule and allocation that meets the goals of the forest and optimizes some objective function including minimizing costs. The model used for this planning is called Spectrum.

resource use and development opportunities: A possible action, measure, or treatment and corresponding goods and services identified and introduced during the scoping process. It may subsequently be incorporated into and addressed by the land and resource management plan in terms of a management prescription.

responsible line officer: The Forest Service employee who has the authority to select and/or carry out a specific planning action.

restoration: The process of assisting the recovery of resilience and adaptive capacity of ecosystems that have been degraded, damaged, or destroyed. Restoration focuses on establishing the composition, structure, pattern, and ecological processes necessary to make terrestrial and aquatic ecosystems sustainable, resilient, and healthy under current and future conditions (FSM 2020.5).

retention: A visual quality objective in which human activities are not evident to the casual forest visitor.

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).

revision: To make the plan new or up-to-date. Plan revision must be considered and approved in accordance with the requirements for the development and approval of a forest plan. Revisions take place every 10-15 years, but may occur more frequently if conditions or public demands change significantly.

right-of-way: A right of use across the lands of others. It generally does not apply to absolute purchase of ownership. Land authorized to be used or occupied for the construction, operation, maintenance, and termination of a project or facility passing over, upon, under, or through such land.

riparian: Land areas directly influenced by water. They usually have visible vegetative or physical characteristics showing this water influence. Streamside, lake borders, and marshes are typical riparian areas.

riparian areas: Areas with three-dimensional ecotones 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 watercourse at a variable width.

riparian-associated species: Species that may use a variety of habitats but that disproportionately make use of aquatic or riparian areas during at least one stage of their life cycle.

riparian corridor: An administrative zone applied to both sides of a stream or alongside a pond, lake, or wetland. It is a fixed width that may fall within or beyond the true riparian area.

riparian-dependent species: Species that are dependent on riparian areas during at least one stage of their life cycle.

riparian functions: Activities that occur in a riparian area without the influence of management activities. Functions include erosion and deposition by the streams, nutrient cycling, movement and storage of water, vegetative succession, etc.

ripping: A process where the soil is mechanically sliced or broken to improve tilth, aeration, and permeability.

road: A motor vehicle path more than 50 inches wide, unless classified and managed as a trail. It may be classed as a system or non-system road.

road closure: A technique used by management to regulate and control the use of facilities to achieve transportation economy, user safety, protection of the public investment, and accomplishment of forest resource objectives. It may be intermittent or long term.

road construction: Activity that results in the addition of forest system or temporary road miles.

road density: See open road density.

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.

road reconstruction: Activity that results in improvement or realignment of an existing system road defined as follows:

road improvement: Activity that results in an increase of an existing road's traffic service level, expansion of its capacity, or a change in its original design function.

road realignment: Activity that results in a new location of an existing road or portions of an existing road, and treatment of the old roadway.

roadless area: National Forest lands evaluated for potential wilderness that meet the criteria in FSH 1909.12, Chapter 7.

Roadless Area Review and Evaluation (RARE) II: The assessment of "primitive" areas within the national forests as potential wilderness areas as required by the Wilderness Act. This refers to the second such assessment that was documented in the final environmental impact statement of the Roadless Area Review and Evaluation, January 1979.

roads analysis process (RAP): Roads analysis is an integrated ecological, social, and economic science based approach to transportation planning that addresses existing and future road management options. The intended effects are to ensure that decisions to construct, reconstruct, or decommission roads will be better informed by using a roads analysis. Roads analysis may be completed at a variety of different scales, but generally begins with a broad forest-scale analysis to provide a context for future analyses.

rotation: The number of years required to establish, including the regeneration period and grow timber crops, to a specified condition or maturity for harvest. Even: and two-aged management prescriptions in the Forest Plan use a rotation.

roundwood: Timber and fuelwood prepared in the round state: from felled trees to material trimmed, barked, and crosscut (e.g.: logs and transmission poles).

RPA Program: The recommended direction for long-range management of renewable resources of National Forest System lands. This direction serves as the basis for the regional targets assigned to the forest. The development of this direction is required by the Forest and Rangeland Renewable Resources Planning Act.

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.

rural water use: Term used in previous water-use circulars to describe water used in suburban or farm areas for domestic and livestock needs. The water is generally self-supplied.

S

sacred sites: 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 tribe or appropriately authoritative representative of an Indian religion had informed the agency of the existence of such a site.

sale schedule: The quantity of timber planned for sale by time period from an area of suitable land covered by a forest plan. The first period (usually a decade) of the selected sale schedule provides the allowable sale quantity. Future periods are shown to establish that long-term sustained yield will be achieved and maintained.

salmonids: Fish of the family salmon idea, the chars, trouts, salmons, and white fishes.

salvage cutting: The removal of dead trees or trees being damaged or killed by injurious agents other than competition. To recover value that would otherwise be lost.

sanitation cutting: The removal of trees to improve stand health and to reduce actual or anticipated spread of insects and disease.

sapling: A usually young tree that is larger than a seedling, but smaller than a pole. Size varies by region.

savanna: an open area with trees covering less than 25 percent and with herbaceous species dominating.

sawtimber: Trees suitable in size and quality for producing logs that can be processed into dimension lumber.

scalloping: The undulating vegetative edge treatment given to a travelway or opening for aesthetic purposes.

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).

Scenery Management System (SMS): A system for the inventory and analysis of the aesthetic values of the National Forest Lands. It replaces the Visual Management System (VMS) as defined in Agricultural Handbook #462.

scenic integrity: A measure of the degree to which a landscape is visually perceived to be “complete.” The highest scenic integrity ratings are given to those landscapes which have little or no deviation from the character valued for its aesthetic appeal. Scenic integrity is used to describe an existing situation, standard for management, or desired future condition.

scenic integrity objective (SIO): A desired level of excellence based on physical and sociological characteristics of an area. Refers to the degree of acceptable alterations to the valued attributes of the characteristic landscape. Objectives include Very High, High, Moderate, and Low.

Very High (VH): Generally provides for only ecological changes in natural landscapes and complete intactness of landscape character in cultural landscapes.

High (H): Human activities are not visually evident to the casual observer. Activities may only repeat attributes of form, line, color, and texture found in the existing landscape character.

Moderate (M): Landscapes appear slightly altered. Noticeable human-created deviations must remain visually subordinate to the landscape character being viewed.

Low (L): Landscapes appear moderately altered. Human-created deviations begin to dominate the valued landscape character being viewed but borrow from valued attributes such as size, shape, edge effect, and pattern of natural openings, vegetative type changes, or architectural styles outside the landscape being viewed.

scoured channel: A definable channel of flow where surface water converges with enough energy to remove soil, organic matter, and leaf litter.

secondary processor: A mill that processes partially manufactured wood (a wood product such as chips or lumber), into a finished product. Examples include paper and furniture.

secondary trout streams: Streams that do not contain naturally-reproducing trout populations, but will sustain trout throughout the year. Populations must be maintained by stocking.

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.

seed-tree with reserves method: A two-aged regeneration method in which some or all of the seed trees are retained after regeneration has become established to attain goals other than regeneration.

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.

selection cutting: The removal of selected trees, particularly mature trees at planned intervals (cutting cycle), individually or in small groups, from an uneven-aged forest to realize the yield, and establish a new crop of desired tree species. Additionally, the tending of immature stand components are accomplished at each cutting cycle.

semi-primitive: See Recreation Opportunity Spectrum

sensitive species: Those species that are placed on a list by the Regional Forester for which population viability is a concern.

sensitivity analysis: A determination of the consequences of varying the level of one or several factors while holding other factors constant.

sensitivity level: A particular degree or measure of viewer interest in the scenic qualities of the landscape.

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. The sequence of treatments can include three distinct types of cuttings: (1) an optional preparatory harvest to enhance conditions for seed production; (2) an establishment harvest to prepare the seed bed, and to create a new age class; and 3) a removal harvest to release established regeneration from competition with the overwood.

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.

short-term effects: In planning, those effects that usually occur within ten years.

short-term facilities: Facilities developed and operated for limited resource activity or other project needs. It will cease to exist as a transportation facility after the purpose for which it was constructed is completed, and the occupied land is reclaimed and managed for natural resource purposes.

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.

significant cave: A cave identified as a significant cave under the authority of The Federal Cave Resources Protection Act of 1988

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 class: A classification of site quality, usually expressed in terms of ranges of dominant tree height at a given age or potential mean annual increment at culmination.

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, codominants, or the largest and tallest trees per unit area) at a specified index or base age.

site productivity class: A species-specific classification of forest land in terms of inherent capacity to grow crops of industrial, commercial wood. Usually derived from the site index.

site quality (productivity): The productive capacity of a site, usually expressed as volume production of a given species.

skid road: A temporary blade-constructed pathway having a road-like function and appearance, used to drag felled trees or logs to a landing. Several skid trails normally branch off of a skid road.

skid trail: A temporary pathway through the woods formed by loggers dragging (skidding) logs from the stump to a log landing or skid road, 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.

slope stabilization: Improving the integrity of soil and rock material on a slope by using various techniques to lessen the chance of the material moving downslope.

snag: A dead or partially dead (more than 50 percent) hardwood or pine tree which is used by many species for perching, feeding, or nesting.

social analysis: An analysis of the social (as distinct from the economic and environmental) effects of a given plan or proposal for action. It includes identification and evaluation of all pertinent desirable and undesirable consequences to all segments of society, stated in some comparable quantitative terms, including persons or percent of population in each affected social segment. In addition, social analysis also includes a subjective analysis of social factors not expressible in quantitative terms.

soil enhancement: Application of methods or materials to the soil to increase its productivity and stimulate growth of biomass.

soil quality The ability of a specific kind of soil to function within its surroundings, support plant and animal productivity, maintain or enhance water and air quality and support human health and habitation. (FSH 2509.18)

soil productivity: The capacity of a soil to produce a specific vegetative community and is dependent on several inherent and climatic characteristics.

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 suitability 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.

soil and water resource improvement: The application of preplanned treatment measures designed to favorably change conditions of water flow, water quality, rates of soil erosion, and enhancement of soil productivity.

southern pine beetle: One of the many species of pine bark beetles that are present in the forest at all times. When environmental and forest conditions become favorable, the beetle populations can increase and cause substantial timber losses over extensive areas in a relatively short period of time.

special places: Those specific locations and expanses in outdoor settings that have attractions and features that are identified as unique, different, distinctive, and extraordinary to people. Special places can range in size from small areas to very large areas.

special use permit: A permit issued under established laws and regulations to an individual, organization, or company for occupancy or use of National Forest System lands for some special purpose.

SPECTRUM: A computer modeling tool to model alternative resource management scenarios applied to landscapes through time in support of strategic and tactical planning. This includes scheduling vegetation manipulation activities to achieve ecosystem management objectives; modeling resource effects and interactions within management scenarios; and exploring tradeoffs between alternative management scenarios in support of decision-making.

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.

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.

standard: A particular action, level of performance, or threshold specified by the Forest Plan for resource protection or accomplishment of management objectives. Unlike "guidelines" which are optional, standards specified in the Forest Plan are mandatory.

stocking: The degree of occupancy of land by growing stock trees, measured by basal area or number of trees per unit area and spacing compared with a minimum standard: which varies by tree size and species or species group: to the occupancy that is required to fully utilize the growth potential of the land.

stratigraphic: Pertaining to strata or layers, as in a description of layers of rock types.

stratum (canopy layer): A distinct layer of vegetation within a forest community.

stressors: Pressure or change brought upon an ecosystem by pollution sources including sediment, contaminants, and toxins.

structure: The horizontal and vertical distribution of components in a vegetation community including the height, diameter, crown layers, and stems of the plants, and the amount and arrangement of snags and down woody material.

successional stage: A period, marked by distinctiveness of structure, in the development of a forest community from establishment of tree regeneration to advanced age. Forest age is used as a surrogate measure of the distinct structure at each stage as follows: early 0-10 years; seedling/sapling 11-40 years; mid 41-80 years; and late over 80 years old.

suitable for timber production: National Forest System land allocated by a Forest Plan decision to be managed for timber production on a regulated basis. *Regulated basis* means a systematic relationship between tree growth and timber harvest such that a specific timber volume objective level can be sustained indefinitely.

suitability: The appropriateness of applying certain resource management practices to a particular area of land, as determined by an analysis of the economic and environmental consequences and the alternative uses foregone. A unit of land may be suitable for a variety of individual or combined management practices.

supply: The amount of a good or service that producers are willing to provide at a specified price, time period, and conditions of sale.

surface use plan of operation: In minerals management, a plan for surface use, disturbance and reclamation on a leasehold.

surficial water: Water on or at the ground surface. Does not include ditches, canals, spillways, or other human-created flow channels.

sustainability: Obtaining yields and services from ecosystems without irreversibly affecting their resilience, natural resistance to change, or ability to meet the needs of future generations.

sustained yield of the products and services: The achievement and maintenance in perpetuity of a high-level annual or regular periodic output of the various renewable resources of the National Forest System without impairment of the productivity of the land.

sympatric: Condition where two or more closely related species live together in the same section of stream. The species have overlapping distributions. Opposite of allopatric.

T

taking: Defined by the Endangered Species Act and US Fish and Wildlife Service as any act which adversely affects a listed species including killing, harassing, harming, pursuing, hunting, capturing or collected a listed animal.

temporary road: A road 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 resource management.

thinning: A cutting made to reduce stand density of trees primarily to improve growth, enhance forest health, or to recover potential mortality.

thinning interval: The period of time between successive thinning entries, usually used in connection with even-aged stands.

threatened species: Any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. Designated as a threatened species in the *Federal Register* by the Secretary of Interior.

timber demand: A relationship between stumpage or delivered log price and the quantity of timber produced.

timber product market area: The geographic area enclosed within a polygon drawn by connecting those mills buying forest timber that are the farthest away from the forest.

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. For purposes of forest planning, timber production does not include the production of fuelwood or harvests from unsuitable lands. (36 CFR 219.3, 1982 rule)

timber removals (drain): The merchantable volume of trees removed from the inventory by harvesting, cultural operations including stand improvement, land clearing, or changes in land use expressed as an annual average between surveys. Within national forests, removals are almost all timber harvest except that the inventory on lands withdrawn by legislative action is also normally accounted for as “removals.”

timber sale program quantity (TSP): The volume of timber planned for sale during the first decade of the planning horizon. It includes the allowable sale quantity (chargeable volume), and any additional material (non-chargeable volume), planned for sale. The timber sale program quantity is usually expressed as an annual average for the first decade.

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.

timberland: Forest land that is producing or capable of producing in excess of 20 cubic feet per acre per year of industrial wood crops under natural conditions. Not withdrawn from timber utilization, and not associated with urban or rural development. Currently, inaccessible and inoperable areas are included.

tolerance: The ability of a tree to grow satisfactorily in the shade of, and in competition with, other trees.

topography: The configuration of a land surface including its relief, elevation, and the position of its natural and human-made features.

toxicity index profile: Estimate of cumulative potential for toxic impacts in water.

traditional cultural property: A historic property that is eligible for inclusion in the National Register because of its association with cultural practices or beliefs of a living community that (a) are rooted in that community's history, and (b) are important in maintaining the continuing cultural identity of the community.

trailheads: The parking, signing, and other facilities available at the terminus of a trail.

traffic service levels: Describe a road's significant traffic characteristics and operating conditions.

two-aged silvicultural system: A planned sequence of treatments designed to maintain and regenerate a stand with two age classes.

two-aged stand: A stand composed of two distinct age classes that are separated in age by more than 20 percent of rotation.

U

unacceptable alteration: A scenic integrity level (never an objective) where human activities of vegetative and landform alterations are excessive and totally dominate the natural, natural-appearing or valued cultural landscape character.

unauthorized road or trail: A road or trail that is not a forest road or trail or a temporary road or trail, and that is not included in a forest transportation atlas.

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 regeneration methods: Methods of regenerating a forest stand, and maintaining an uneven-aged structure by removing some trees in all size classes either singly, in small groups, or strips. The methods are single-tree or group selection.

uneven-aged silvicultural system: A planned sequence of treatments designed to maintain and regenerate a stand with three or more age classes.

universal soil loss equation: An equation used to estimate soil erosion rates and for the design of water erosion control systems. A = RKLSPC wherein A = average annual soil loss in tons per acre per year; R = rainfall factor; K = soil erodibility factor, L = length of slope; S = percent of slope; P = conservation practice factor; and C = cropping and management factor.

unregulated forest: Commercial forest land that will not be organized for timber production under sustained-yield principles.

utility-scale wind energy: Large scale wind turbines (also known as utility wind turbines) that are normally tied directly into the utility grid and are used to provide electrical power for entire communities and

municipalities. Each of these large, "utility-scale," wind turbines can have blade lengths up to 150ft and sit on a 200ft tower, and produce enough electricity for 500-600 average homes per year. Small scale wind turbines (also known as home or residential wind turbines) can either be connected to the utility grid or stand-alone as an "off-grid" application, normally providing electrical power for home, farm, school, or business applications. Small scale wind machines can have blade length between 3ft-30ft, with a 100ft tower, and can power between 1/4 to 6 average American homes.

utilization standards: Measurements for standing trees that describe the minimum size tree that will be designated for sale for various products including sawtimber or small roundwood.

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.

vertical diversity: The diversity in a stand that results from the different layers or tiers of vegetation.

very low scenic integrity (VL): An existing scenic inventory classification in which landscapes appear heavily altered. Human created deviations may strongly dominate the valued landscape character. They may not borrow from valued attributes of size, shape, edge effect, and pattern of natural openings, vegetative type changes, or architectural styles within or outside the landscape being viewed. However, deviations must be shaped and blended with the natural terrain so that elements such as edges, roads, landings, and structures do not dominate the composition.

viable population: Population of plants or animals that has the estimated numbers and distribution of reproductive individuals to ensure its continued existence is well distributed in the planning area. To insure that viable populations will be maintained, habitat must be provided to support, at least, a minimum number of reproductive individuals and that habitat must be well distributed so that those individuals can interact with others in the planning area.

viewing platform: Viewing platforms are areas where people routinely view landscapes. They include but may not be limited to roads, roadside pullouts, parking areas, trails, rivers, lakes, developed recreation sites, known dispersed campsites, visitor centers, and residential areas. Due to intervening landforms, rock outcrops, and vegetation, not all of the landscape within the foreground, middleground and background distance zones is visible.

viewshed: The total landscape seen, or potentially seen from all or a logical part of a travel route, use area, or waterbody.

visual quality objective (VQO): A term under the Visual Management System (VMS) as defined in Agricultural Handbook #462 which was replaced by “scenic integrity objective” under the Scenery Management System (SMS). A desired level of excellence based on physical and sociological characteristics of an area under the Visual Management System. Refers to the degree of acceptable alterations of the characteristic landscape. Objectives include Preservation, Retention, Partial Retention, Modification, and Maximum Modification. Except for “preservation,” each goal describes a different degree of acceptable alteration of the natural landscape based on the importance of aesthetics.

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

warm water fishery: Aquatic habitats that support fish species which have their best reproductive success and summer water temperature tolerance between 75 and 85 degrees Fahrenheit (23-29 C), or about 80 degrees Fahrenheit. Examples include sunfish species, and largemouth bass.

water-holding capacity: The ability of the soil to absorb and hold water, expressed in inches of water per vertical foot of soil.

water supply area: Areas that serve present and future municipal water supply and trout hatching or rearing operations.

watertable: The 'surface' of the subsurface materials that are saturated with groundwater in a given vicinity.

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 fireline used to divert water off the surface to prevent it from eroding ruts and possibly carrying sediment to a stream.

watershed: The total area above a given point on a stream that contributes water to the flow at that point.

weathering: The breaking down of Earth's rocks, soils and minerals through direct contact with the planet's atmosphere.

wetlands: Pursuant to the Federal Clean Water Act: areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances, support a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas, and are found primarily within palustrine systems; but may also be within riverine, lacustrine, estruarine, and marine systems.

wild and scenic river: A river or section of river designated as such by congressional action under the Wild and Scenic Rivers Act of Oct. 2, 1968, as supplemented and amended, or those sections of a river designated as wild, scenic, or recreational by an act of the legislature of the state or states through which it flows. A river can be classified under the following three categories:

- **wild river**: Free of impoundments and generally inaccessible except by trail, and within watersheds or shorelines that are essentially primitive.
- **scenic river**: Free of impoundments but accessible by roads, and within watersheds or shorelines that are still largely primitive and undeveloped.
- **recreational river**: Readily accessible by roads, with some development along their shorelines and may have undergone some impoundment or diversion in the past.

wildfire: Unplanned human (unauthorized or accidental) or natural (usually lightning) fires in wildlands.

wilderness: An area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected through congressional designation and managed so as to preserve its natural conditions and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value." (Source – The Wilderness Act of 1964)

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.

wildland fire: a general term describing both prescribed fire and wildfire (unplanned human or naturally caused fire) that occurs in the wildland.

wildland urban interface (WUI): The line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels.

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.

wildlife and fish user-day (WFUD): A 12-hour participation in the use of wildlife and fish primarily for consumptive or non-consumptive use including hunting, fishing, or wildlife viewing. Such use is the result of habitat management, and the populations supported by that habitat. A WFUD is counted as one day or any part of a day that the user participated in these activities. Does not include sport or commercial uses of anadromous fish.

wildlife habitat diversity: The distribution and abundance of different plant and animal communities and species within a specific area.

wildlife habitat improvement: The manipulation or maintenance of vegetation to yield desired results in terms of habitat suitable for designated wildlife species or groups of species.

wildlife tree: A den tree, snag, or mast or food tree.

with-without comparison: An evaluation that compares outputs, benefits, costs, and other effects with a base alternative.

withdrawn national forest lands: National Forest System lands segregated or otherwise withheld from settlement, sale, location, or entry under some or all of the general land laws.

woodland: an open stand of trees with crowns not usually touching (generally forming a 25 to 60 percent cover).

woody biomass: Vegetation removed from the forest, usually logging slash, small diameter trees, tops, limbs, or trees not considered merchantable in traditional markets. (http://www.forestguild.org/publications/research/2012/FG_Biomass_Guidelines_SE.pdf)

wood biomass energy: Wood (solid wood, tree trimmings, wood chips, sawdust, bark, and shavings) used to produce heating, electricity, or other forms of energy. (http://mwcc.edu/renewable/biomass.html)

woody biomass utilization: The harvest, sale, offer, trade, or utilization of woody biomass to produce the full range of bio-based products and bio-energy, including timber, engineered lumber, paper and pulp, furniture and value-added commodities, and bio-energy and/or bio-based products such as plastics, ethanol, and diesel.

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.

yield table: A tabular statement of outputs expected to be produced under a specific set of conditions.

APPENDIX G: RESEARCH NEEDS

A key element of adaptive management is monitoring. Another element is that of research. Ongoing monitoring will identify needs for further research as the plan is implemented. At its inception; however, the plan can identify areas of concern that can be the subject of "research needs."

SOIL AND WATER

Determine effectiveness of riparian corridor prescription on terrestrial species dependent upon riparian resources.

Determine whether soil productivity is altered by acid deposition. If it is altered, where is this occurring, how does this affect management activities such as timber harvest and prescribed burning, does it affect mountaintop balds, and what are our options for mitigation or remediation?

TIMBER

Methods to enhance the regeneration of northern red oak, white oak and chestnut oak on more productive sites.

FOREST HEALTH

Determine rate of spread of noxious or invasive non-native plant species relative to road density or proximity to travel corridors.

Cultural practices necessary to successfully restore American chestnut once resistant planting stock becomes available.

Determine effectiveness of prescribed burning to restore and maintain woodlands, savannahs, and grasslands.

Determine effects of the loss of hemlock on riparian systems, including aquatic habitat.

ECOLOGICAL SYSTEMS

Identify best methods to expand red spruce within its former range, northern hardwood stands, and open areas.

Determine rate of spread of noxious or invasive non-native plant species relative to road density or proximity to travel corridors.

INDIANA BAT

Identify roost trees, maternity sites, summer foraging areas, fall swarming areas and other areas of the Forest used by Indiana bats. Characterize and quantify habitat at these sites to help identify additional sites and develop management strategies for the protection, maintenance, and recovery of the Indiana bat.

CLIMATE CHANGE

Identify vulnerable species and systems and identify tools to facilitate adaptation strategies.

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APPENDIX H: MONITORING TASKS

The monitoring questions identified in Chapter 5 are summarized as follows:

1. How are ecological conditions maintaining or making progress toward the LMP desired conditions and objectives?
2. What are the current condition and trend of key characteristics for vegetation identified in the desired conditions (DC) for the plan area?
3. How are management actions maintaining or making progress toward DC for the key characteristics of vegetation in the plan area?
4. How are ecological conditions for selected T&E species, sensitive, or locally rare maintaining or making progress toward the LMP desired conditions and objectives?
5. How are management actions for the recovery of T&E species, conservation of sensitive, and management of locally rare achieving LMP objectives?
6. How are changes in Management Indicator Species and the relationship to their habitats reflecting the effectiveness of management activities in achieving desired conditions and objectives?
7. What are the status and trends of areas infested by aquatic and terrestrial invasive species on the unit's plan area relative to the desired condition?
8. How effective were our management activities including partnerships in preventing or controlling targeted invasive species (some of which may be Species of Interest)?
9. What is the distribution and trend in Fire Regime Condition Class on the National Forest/Grassland?
10. How effective are management actions in moving the National Forest/Grassland toward FRCC 1?
11. What are the status and trends of outbreaks of native insects and pathogens on the National Forest/Grassland?
12. What are the trends in areas at risk to future outbreaks of native insects and pathogens on the National Forest/Grassland?
13. What is the ecological condition and trend of watershed health, including the aquatic ecosystem potential, for watersheds identified in the desired condition and/ or objectives of the plan area?
14. How effective are management actions in moving the National Forest/Grassland toward improving watershed health?
15. Are management systems implemented in a manner to assure they do not substantially and permanently impair the productivity of the land?
16. What is the status and trend of settings and opportunities provided by the NFS unit compared to Desired Conditions stated in the LMP?
17. How are management actions maintaining or improving Desired Conditions for settings and opportunities provided by the NFS unit, including contributions to sustaining social systems within the unit's LMP analysis area?
18. How do people involved in the adaptive planning process interpret settings and opportunities provided by the NFS unit compared with Desired Conditions? Do they think there is a need for change?
19. What are the status and trends of goods and services provided from the unit with regards to progress towards desired conditions?
20. How do these goods and services contribute to key opportunities for sustaining economic systems relevant to the plan area?
21. How many miles of the designated roads and trails are maintained to standard?

22. Where is unauthorized use occurring on or off the road and trail system?
23. Are the impacts from the road and trail system on soils, water quality, wildlife, and other natural and cultural resources sustainable and within acceptable tolerance?
24. Is the road and trail system serving its intended purposes and addressing recreational demands?
25. What is the impact of climate change on the planning area?
26. What changes are occurring in the social, cultural, and economic conditions in the areas influenced by national forests in the region?
27. How has climate variability changed and how is it projected to change across the region?
28. How is climate variability and change influencing the ecological, social, and economic conditions and contributions provided by plan areas in the region?
29. What effects do national forests in the region have on a changing climate?

The monitoring summary table follows.

Monitoring Questions	Element	Task #	Method of Collection	Reporting Frequency	Precision/ Reliability	Responsibility
4 & 25	Trends in the conditions of Special Biological Areas	1	Annually schedule site visits to track locations, composition and condition of selected sample of Special Biological Areas utilizing standard GIS coverage and NRIS Terra, FSVeg and Fauna databases. Utilize standard reports for reporting.	5 Year Intervals	Moderate	Forest Ecologist or Botanist
1	Status and trend in the extent and condition of ecological systems.	2	Map and update changes through annual routine inventories. Monitor acres by major forest and woodland community type and trends	5 Year Intervals	Moderate	Forest Silviculturist
2 & 3	Acres of silvicultural treatments implemented by activity type and forest type	3	Summarize acres of treatments by major community type utilizing established activity tracking systems.	Annual	Moderate	Forest Silviculturist
2 & 3	Acres burned (wildfire and prescribed fire) by forest type and season of burn compared to desired fire regimes	4	Acres burned (wildfire and prescribed) by ecological system. Maps of prescribed burn units are incorporated into the GIS data base annually, by the end of the burning season. Total acres are determined from a GIS query.	Annual	Moderate	Forest Ecologist
6 & 25	Trends in MIS populations in relationship to the ecological system/condition MIS was selected to indicate.	5	Annual Breeding Bird Survey occurrence trends for selected MIS compared to status and trends in forest cover acreage in Task #3.	5 Year Intervals	Moderate	Forest Ecology Group
4, 5 & 25	How many acres of high-elevation early successional habitats exist and what are the trends in their abundance and condition	6	Map and update changes through periodic routine inventories. Monitor acres and trends.	5 Year Intervals	Moderate	Forest Silviculturist
3	Acreage of existing and potential old growth by forest community class	7	Rerun FSVeg analysis periodically or as needed	5 Year Intervals	Moderate	Forest Silviculturist
3	Trends in hard mast production capability	8	Map and update changes in forest composition and condition through annual routine inventories. Infer mast production capability from the status of older age classes of oak forest community types	5 Year Intervals	Moderate	Forest Silviculturist

Monitoring Questions	Element	Task #	Method of Collection	Reporting Frequency	Precision/ Reliability	Responsibility
4 & 5	Abundance of snags and downed wood	9	Map and update changes in forest successional conditions and area impacted by insect and disease through routine annual inventories. Infer snag and downed wood by the acres of late-successional stage forests and mortality due to insects and disease	Annual	Moderate	Forest Silviculturist
13, 14 & 25	Conditions and trends in the overall health of streams including trends in water quality parameters and physical habitat conditions in relationship to aquatic communities	10	Water quality sampling, emphasis on nitrogen, sulfur, and mercury compounds. Aquatic macroinvertebrate sampling (EPA's Rapid Bioassessment Protocol II (EPA 1989) with modifications by Smith & Voshell (1997)). Systematic stream fish community inventories, stream stability, streambed structure and large woody debris as appropriate. Sample selected streams on a periodic basis and use fixed sampling points - coordinate locations with other aquatic monitoring.	Annual	High to Moderate	Forest Ecology Group
13, 14 and 25	Trends in presence and abundance of wild trout in relation to acidification of stream systems and the application of mitigating measures.	11	Sample selected streams on a periodic basis for wild trout and pH in high elevation streams using systematic stream fish community inventories.	As Available	High	Forest Aquatic Biologist
13, 14 & 25	Trends in air pollution effects on forest soil and vegetation.	12	Complete assessment of watersheds at risk from acid deposition. Sample soil water and vegetation in high risk areas.	As Available	High to Moderate	Forest Ecology Group & Silviculturist
13, 14 & 25	Trends in air pollutants (ozone, fine particulates, and acid deposition).	13	Summarize air quality monitoring data from sites on or near the Forest, especially acid deposition and ozone.	Annually	High to Moderate	Zone Air Specialist
9 & 10	Conditions and trends of forest fuels and acres of fuels treated through the use of wildland fire and mechanical treatment	14	Fuel monitoring following Regional protocol. Acres of fuels treated through the use of wildland fire and mechanical treatment mapped into the GIS data base reports generated through GIS/NRIS FSVeg queries.	Annual	Moderate	Forest Fire Management Group

Monitoring Questions	Element	Task #	Method of Collection	Reporting Frequency	Precision/ Reliability	Responsibility
7, 8, 11, 12 & 25	What are the trends in insect and disease effects? [36 CFR 219(k)(5)(iv), 36 CFR 219.20(b)]	15	Map and update trends in insect and disease outbreaks and epidemics using routine inventory methods as part of Forest Health Monitoring Program.	Annual	High	Forest Health Program
4 & 5	Population status of shale barren rock cress and progress towards recovery. [MIS - 36 CFR 219.19(a)(6)]	16	Support monitoring efforts outlined in recovery plan and visit an average of 20% of known sites on GWNF annually.	Annual	Moderate	Forest Botanist
4 & 5	Population status of James spinymussel and progress towards recovery. [MIS - 36 CFR 219.19(a)(6)]	17	Support monitoring efforts outlined in recovery plan as feasible given that known locations are not on the GWNF.	Annual	Moderate	Forest Aquatic Biologist
4 & 5	Population status of Virginia big-eared bat and progress towards recovery. [MIS - 36 CFR 219.19(a)(6)]	18	Support monitoring efforts outlined in recovery plan as feasible given that known hibernacula are not on the GWNF.	Annual	Moderate	Forest Biologist
4 & 5	Population status of Indiana bat and progress towards recovery. [MIS - 36 CFR 219.19(a)(6)]	19	Follow recovery plan and protocols of Indiana bat Recovery Team. Support biennial surveys of all Indiana bat hibernacula. Yearly surveys for 3 years on newly gated hibernacula, then biennial.	2 Year Intervals	Moderate	Forest Ecologist
4 & 5	Population status of northeastern bulrush and progress towards recovery. [MIS - 36 CFR 219.19(a)(6)]	20	Support monitoring efforts outlined in recovery plan and visit known sites on GWNF at least once every five years.	Annual	High	Forest Botanist
4 & 5	Population status of Virginia sneezeweed and progress towards recovery. [MIS - 36 CFR 219.19(a)(6)]	21	Support monitoring efforts outlined in recovery plan and visit known sites on GWNF at least once every five years.	Annual	High	Forest Botanist
4 & 5	Population status of swamp pink and progress towards recovery. [MIS - 36 CFR 219.19(a)(6)]	22	Support monitoring efforts outlined in recovery plan and visit an average of 20% of known sites on GWNF annually.	Annual	High	Forest Botanist
4 & 5	Population status of smooth coneflower and progress towards recovery. [MIS - 36 CFR 219.19(a)(6)]	23	Support monitoring efforts outlined in recovery plan and visit known sites on GWNF at least once every five years.	Annual	High	Forest Botanist

Monitoring Questions	Element	Task #	Method of Collection	Reporting Frequency	Precision/ Reliability	Responsibility
4 & 5	Population status of Virginia northern flying squirrel and progress towards recovery. [MIS - 36 CFR 219.19(a)(6)]	24	Support monitoring efforts outlined in recovery plan and visit known sites on GWNF at least once every five years	Annual	High	Forest Biologist
4 & 5	Presence/absence of golden-winged warblers in suitable habitats.	54	Standardized surveys for Golden-winged warblers using transects and playback in high-elevation early successional habitats. Habitat characterized at occupied sites.	5 Year Intervals	High	Forest Ecology Group
4 & 5	Presence/absence of cerulean warblers in suitable habitats.	55	Using standardized survey methods, determine presence/absence of cerulean warbler in optimum habitats. If present, determine habitat relationships.	5 Year Intervals	High	Forest Ecology Group
6 & 26	Trends in harvest data for demand MIS in relationship to habitat improvement activities for those animals? [MIS - 36 CFR 219.19(a)(6)]. (See Table 5-6 in Chapter 5).	25	Collect harvest data from Cooperating State Agency related to annual accomplishments for habitat improvement tracked with standard tracking systems	5 Year Intervals	High	Forest Biologist
16, 17, 24 & 26	Results and trends in user satisfaction ratings [36 CFR 219.21(a)]	26	Analysis of NVUM customer satisfaction data for Day Use, Overnight General Forest Area, and Wilderness programs and local Customer Satisfaction survey tools.	5 Year Intervals	Low/ Moderate	SO-Recreation Staff
16, 17 & 26	Are semi-primitive recreation settings and backcountry recreation opportunities maintained or increased?	27	Analysis of road construction, reconstruction, and maintenance activities in relation to semi-primitive (SPNM, SPM, & SP2) ROS settings through review of site-specific projects.	Annual	High	Forest Recreation Staff
20, 21, 23 & 26	Are motorized and nonmotorized trails being maintained?	28	Analysis of INFRA Deferred Maintenance Report and reporting of per cent change in backlog.	Annual	High	Forest Recreation Staff
22	Where is unauthorized use occurring?	29	Analysis of law enforcement citations	Annual	Moderate	Forest Recreation Staff

Monitoring Questions	Element	Task #	Method of Collection	Reporting Frequency	Precision/ Reliability	Responsibility
16, 17 & 26	Is wilderness visitor use within limits that do not impair the values for which the wilderness was established? [36 CFR 219.18(a)]	30	Analyze trends in wilderness visitor use and compile summary report using GIS mapping (number and location of concentrated use areas) and use of visitor satisfaction results using NVUM and wilderness trailhead registration data.	5 Year Intervals	Moderate	Forest Recreation Staff
1	Trends in fire regimes and effects on fire dependent communities in Wilderness	31	Annual summary report of number of Wildland Fire Use Fires and acres and number of management ignited fires and season of burn.	Annual	Moderate	Forest Fire Management Group
13, 14 & 25	Trends in air quality related values in Class 1 Wilderness areas [36 CFR 219.27(a)(12)]	32	IMPROVE national aerosol monitoring network, water quality sampling for acid deposition, vegetation sampling for ozone & long-term trends, soil water sampling.	As Available	High to Moderate	Zone Air Specialist & National data analysis
16, 17 & 26	Acres of National Forest land that meet or exceed established scenic quality objectives [36 CFR 219.27(c)(6), 36 CFR 219.27(d)(1)]	33	Treatment and location data entered in activity tracking system at time treatment completed. Summary report of project acres that meet or exceed the assigned SIO.	Annual	Low/ High	Forest Landscape Architect
17 & 26	Are heritage sites being identified for protection? Are protection measures effective? [36 CFR 219.24(a)(4)]	34	Heritage inventories and surveys pursuant to 106 for all ground disturbing projects are reviewed by SHPO/THPO per Regional PA and Forest MOUs. Sample field condition assessment of sites eligible or listed in National Register. Review of preservation/maintenance plans completed. Condition assessments on Priority Heritage Assets are current and allocated to mgmt category to guide the asset's protection and use.	Annual	High	Forest Archeologist
13, 14 and 25	Condition and trend of chemical resilience of watersheds across the Forest as indicated by chemical parameters	35	Water quality sampling protocol	Periodic	Moderate/ High	Forest Hydrologist
14	Effect of management activities on soil quality and productivity [36 CFR 219.12(k)(2), 36 CFR 219.27(a)(1)]	36	Assess projects for long term effects to soil productivity. Compare assessments to NEPA estimates.	Periodic or at random	Moderate/ High	Forest Soil Scientist

Monitoring Questions	Element	Task #	Method of Collection	Reporting Frequency	Precision/ Reliability	Responsibility
14 & 23	Are temporary roads being revegetated within 10 years of contract or permit termination? [36 CFR 219.27(a)(11)]	37	Sample projects during program reviews to determine and document that standard is being met.	Annual	Moderate	Forest Soil Scientist and Forest Engineer
14	Are State BMPs and Forest Standards being implemented to protect and maintain soil and water resources? [36 CFR 219.27(a)(4), 36 CFR 219.12(k)(2)]	38	Field inspection of project sites following established monitoring protocol. Review of sample of project documents and related EAs/EISs for compliance with BMPs and standards.	Annual	Moderate/ High	Forest Hydrologist and Soil Scientist
14	Are Standards (BMPs) Effective minimizing non-point source pollution?	39	Sample project activities related to BMPs for effectiveness of BMPs and standards. 1) Visual inspection of implemented standards, 2) Measured effects of standards, and/or 3) Aquatic biota inventories.	Periodic or at random	Moderate	Forest Hydrologist and Soil Scientist
19 & 20	Are forest products being produced within predicted ranges? [36 CFR 219.27 (c)(2)]	40	Sales Tracking and Reporting System	Annual	High	Forest Timber Management Staff
14	Are livestock management systems and improvements adequately protecting riparian areas and aquatic habitats?	41	Pastures monitored annually for livestock damage.	Annual	High	Forest Soil Scientist
14 & 23	Are roads being maintained, constructed or reconstructed to reduce sediment delivery to water bodies and to provide a transportation system that supplies safe and efficient access for forest users while protecting forest resources. [36 CFR 219.27 (a)(10)]	42	Miles of National Forest System Roads (NFSR) exist compared to miles maintained to their objective maintenance level. Miles of road improved. Routine condition surveys on 25-33% of roads per year. Miles of road decommissioned (classified and unclassified) with reasons for decommissioning. Miles of right-of-way settled and acres of National Forest land accessed as a result.	Annual	Moderate	Forest Engineer
19, 20 & 26	Were special use authorizations processed in a timely manner?	43	Review of requests received and process time elapsed to decision.	5 Year Intervals	High	Forest Lands Staff

Monitoring Questions	Element	Task #	Method of Collection	Reporting Frequency	Precision/ Reliability	Responsibility
18, 19 & 26	Are National Forest System lands being managed to improve management effectiveness and enhance public benefits?	44	Miles of boundary surveyed. Title claims and encroachments resolved. Acres of lands acquired and reasons for acquisition. Lands conveyed and reasons for conveyance.	Annual	High	Forest Lands Staff
18 & 26	How do estimated and actual costs of plan implementation compare? [36 CFR 219.12(k)3]	45	Review of projected forest plan costs compared to actual costs and annual budgets.	5 Year Intervals	Moderate	Forest Planning Staff
3 & 15	Are lands being adequately restocked within 5 years of regeneration treatments? [36 CFR 219.27(c)(3)]	46	Routine regeneration examinations following standard protocols.	Annual	High	District Silviculturists
3 & 15	Are lands not suited for timber production classified as such? [36 CFR 219.12(k)5(ii)] Have lands identified as not suitable for timber production become suitable? [36 CFR 219.14 (a)(d), 36 CFR 219.27(c)(1)]	47	Routine timber stand inventory and prescription documented in CISC. Review changes every ten years.	10 Year Intervals	Moderate	District Silviculturists and Forest Silviculturist
3 & 15	Are harvest unit sizes within the allowable limits? [36 CFR 219.12(k)5(iii)] Should maximum harvest unit size limits be continued? [36 CFR 219.27(d)]	48	Annual field inspection of selected site-specific projects. Document needs for change in annual Monitoring and Evaluation Report if appropriate.	As Appropriate	Moderate	Forest Silviculturist, Planning IDT
3 & 15	Are appropriate harvest methods used on the Forest? [36 CFR 219.27]	49	Annual field inspection of selected site-specific projects. Document needs for change in annual Monitoring and Evaluation Report if appropriate.	As Appropriate	Moderate	Forest Silviculturist, Planning IDT
	Determine whether standards, guidelines, and management requirements are being met and are effective in achieving expected results. [36 CFR 219.27 (a)(6)]	50	Annual field inspection of selected site-specific projects. Document needs for change in annual Monitoring and Evaluation Report if appropriate.	As Appropriate	Moderate	Planning IDT

Monitoring Questions	Element	Task #	Method of Collection	Reporting Frequency	Precision/ Reliability	Responsibility
	Determine when changes in GPRA, policies, or other direction would have significant effects on Forest Plans. [36 CFR 219.10(g)]	51	5 year review	5 Year Intervals	Moderate	Forest Planning Staff
	Determine if planning information or physical conditions have changed. [36 CFR 219.10(g)]	52	5 year review	5 Year Intervals	Moderate	Forest Planning Staff
	During monitoring determine research needs. [36 CFR 219.28]	53	Document research needs in annual Monitoring and Evaluation Report if appropriate.	As Appropriate	Moderate	Planning IDT
26	Identify plan contributions to the social, cultural and economic sustainability of communities, which is part of monitoring the progress toward meeting the desired conditions and objectives, including providing multiple use opportunities. [36 CFR 219.12(a)(5)(vii)]	54	The Region 8 Broader-Scale Monitoring Strategy will address and evaluate this monitoring questions. The Forest will incorporate in the Forest Evaluation Report.	TBD	TBD	Region 8
27, 28 & 29	Identify measurable changes on the plan area related to climate change and other stressors that may be affecting the plan area. [36 CFR 219.12(a)(5)(vi)]	55	The Region 8 Broader-Scale Monitoring Strategy will address and evaluate these monitoring questions. The Forest will incorporate in the Forest Evaluation Report.	TBD	TBD	Region 8

APPENDIX I: MAPS OF AREAS WITH ADDITIONAL TIMBER HARVEST AND ROAD CONSTRUCTION LIMITATIONS

The following maps depict the portions of the Appalachian National Scenic Trail Corridor (4A), Special Biological Area (4D), and Shenandoah Mountain Crest (8E7) Management Prescription Areas that are within surrounding Remote Backcountry Recreation (12D) Management Prescription Areas and where additional standards are required regarding timber harvest and road construction. See the appropriate Management Prescription Area direction for details on the standards.

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APPENDIX J: BIOLOGICAL OPINION – INCIDENTAL TAKE STATEMENT

Source: Extracted from U.S. Fish and Wildlife Service's Biological Opinion, June 12, 2013, as modified by letters of March 5, 2014 and April 21, 2014, issued for the 2013 Revised George Washington Land and Resource Management Plan, Virginia and West Virginia, Project #2012-F-1762.

INCIDENTAL TAKE STATEMENT

Sections 9 of the Endangered Species Act (ESA) and Federal regulation pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without a special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the U.S. Fish and Wildlife Service (FWS) to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns such as breeding, feeding, or sheltering. Harass is defined by the FWS as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns, which include, but are not limited to, breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the ESA provided that such taking is in compliance with the terms and conditions of this incidental take statement.

The measures described below are nondiscretionary, and must be undertaken by the Forest Service (FS) so that they become binding conditions of any grant or permit issued to the applicant, as appropriate, for the exemption in section 7(o)(2) to apply. The FS has a continuing duty to regulate the activity covered by this incidental take statement. If the FS (1) fails to assume and implement the terms and conditions or (2) fails to require the applicant to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. To monitor the impact of incidental take, the FS must report the progress of the action and its impact on the species to the FWS as specified in the incidental take statement.

AMOUNT OR EXTENT OF TAKE

The 2013 Revised George Washington Land and Resource Management Plan (GWLRMP) is a comprehensive landscape level document to guide management decisions. All project level activities will undergo National Environmental Policy Act review when the project is proposed, as well as assessment of project effects to federally listed and proposed species and designated and proposed critical habitat in compliance with section 7 of the ESA. For any projects that may affect federally listed or proposed species or designated or proposed critical habitat, the FS will consult with the FWS on a project-by-project basis. The management prescriptions and standards in the 2013 Revised GWLRMP considerably reduce the potential for adverse effects and incidental take to occur. However, the FWS anticipates incidental take of the Indiana bat from implementation of gas leasing, prescribed fire, timber harvest, salvage activities, wildlife habitat management, and special use activities.

The FWS anticipates incidental take of the Indiana bat will be difficult to detect for the following reasons: the bat's small body size, individuals are widely dispersed, individuals are difficult to detect under loose tree bark, bats utilize different parts of the GWNF depending on the season, and the lack of understanding of how Indiana bats utilize the GWNF. Additionally, it would be virtually impossible to know if a maternity colony or roosting Indiana bat(s) is utilizing an area unless all potential roost trees are inspected prior to habitat disturbance, there was evidence such as bats leaving the tree as it is being felled, or a post disturbance inspection of all potential roost trees was conducted. Therefore, the amount of potential roosting, foraging, or maternity sites affected will serve as a surrogate to assess incidental take of the Indiana bat.

The FWS anticipates up to 3,513 acres of potential Indiana bat habitat will be affected as a result of access

roads and well pads for gas leasing (39 acres), timber harvest and salvage activities (3,400 acres), wildlife habitat management (50 acres), and special use activities (24 acres) annually. Up to 20,000 acres of potential Indiana bat habitat will be affected as a result of prescribed fire annually. Access roads and well pads for gas leasing, prescribed fire, timber harvest, salvage activities, wildlife habitat management, and special use activities in total are expected to result in an annual removal or disturbance of up to 23,513 acres of potential Indiana bat habitat, or 2.2% of the GWNF.

The 2013 winter surveys counted 131 Indiana bats in hibernacula on or near the GWNF. If we assume the percent of potential Indiana bat habitat disturbed equates to the percent of individual bats disturbed (131 x 2.2% = 2.88), then 3 adult Indiana bats would be disturbed. Two additional bats were added to this total since there is potential of disturbing pups in addition to a mother. Therefore, the FWS anticipates incidental take of up to 5 Indiana bats on an annual basis as a result of access roads and well pads for gas leasing, prescribed fire, timber harvest, salvage activities, wildlife habitat management, and special use activities. The incidental take is expected to be in the form of kill, harm, or harass.

The Bureau of Land Management (2012) estimates an average completion time for a vertical well is 14 days and 28 days for a horizontal well. The likelihood of drilling impacting a roost tree depends on the proximity of the activity in relation to the roost tree. If 39 acres of disturbance are associated with exploratory and development access roads and well pads for gas leasing and we assume the percent of potential Indiana bat habitat disturbed equates to the percent of individual bats disturbed, it is likely that less than 1 roosting bat will be impacted. However, if drilling occurred near a roost tree, it would affect the bats for the majority of their summer time use. We assume the incidental take is a function of both time (number of days during which drilling occurs) and the likelihood of impacting a roosting bat. Therefore, 1 adult Indiana bat would be disturbed and there is potential of disturbing a pup in addition to a mother. Therefore, the FWS anticipates incidental take of up to 2 Indiana bats from drilling for gas exploration near an active roost tree when bats are not in hibernation. The incidental take is expected to be in the form of harassment.

EFFECT OF THE TAKE

In the accompanying programmatic biological opinion, the FWS determined that this level of anticipated take is not likely to result in jeopardy to the species or destruction or adverse modification of critical habitat.

REASONABLE AND PRUDENT MEASURES

The FWS believes the following reasonable and prudent measure is necessary and appropriate to minimize take of the Indiana bat:

- During implementation of the 2013 Revised GWLRMP, the FS in cooperation with the FWS and the Virginia Department of Game and Inland Fisheries shall continue efforts to determine use of the GWNF by Indiana bats during the hibernation, summer roosting, maternity, and pre-hibernation seasons. As efforts to determine Indiana bat use of the GWNF provide a clearer understanding of how Indiana bats use the Forest, management activities described in the 2013 Revised GWLRMP shall be directed to areas and times of minimal bat use.

TERMS AND CONDITIONS

To be exempt from the prohibitions of section 9 of the ESA, the FS must comply with the following terms and conditions, which implement the reasonable and prudent measures described above and outline the required reporting/monitoring requirements. These terms and conditions are non-discretionary.

1. The FS will continue efforts to determine use of the GWNF by Indiana bats during the hibernation, summer roosting/maternity, and pre-hibernation seasons by implementing the monitoring outlined below. Selection of sites for monitoring and research will be left to the discretion of the FS biologists in consultation with the FWS and/or Virginia Department of Game and Inland Fisheries. The FWS believes that implementation of this term and condition is necessary to evaluate the underlying assumptions made on Indiana bat presence and characterized use on the GWNF. Implementation of this term and condition will, in turn, provide a more site-specific measure of the protective adequacy of the conservation measures for the Indiana bat on the GWNF.

a. Continue monitoring by working with the FWS, universities, the Virginia Department of Game and Inland Fisheries, the Virginia Department of Conservation and Recreation, and other experts to locate and survey caves and mines that may contain Indiana bats. Surveys of all known Indiana bat hibernacula shall continue every two years following the protocol of the Indiana Bat Recovery Team. After any new gating of a hibernaculum, yearly surveys shall be conducted to determine the effects of the gates. This effort will be conducted for the first three years after gating and then continue with biennial monitoring according to the Indiana bat Recovery Team protocol.

b. Continue monitoring efforts to refine the distribution and abundance of the Indiana bat on the GWNF. Survey efforts shall be focused on those areas which, based on habitat characteristics (percent canopy closure, presence of suitable roost trees, proximity to water, etc.) and/or previous survey results, appear to be conducive to maternity colonies. These surveys shall be designed to determine the distribution of the species on the GWNF and its habitat use and movements during the spring through fall periods. Monitoring should occur at least every three years and shall cover an area identified by the collaboration of FS and FWS biologists with the input of Virginia Department of Game and Inland Fisheries biologists and other species experts. Surveys shall be designed by FS bat biologists or qualified bat biologists and should be submitted to the FWS for review and approval prior to implementation. If any Indiana bats are captured during mist-net surveys, the FWS and the Virginia Department of Game and Inland Fisheries must be notified within 24 hours. The habitat at identified maternity sites will be characterized and quantified, and these habitat data will then be used to assist in identifying additional sites. Information gained during these studies can be used to refine FS strategies for the protection and management of the species.

c. Habitat at all sites where Indiana bats are documented on the GWNF shall be characterized and quantified at both local and landscape levels.

d. The FS shall provide the results of these surveys to the FWS within six months of completion.

2. The amount of incidental take as measured by acreage (both total and by management activity) must be monitored on an annual basis. The FS will report the number of acres disturbed on a fiscal year basis, to include regeneration harvest, salvage, prescribed burns, and other actions such as special use permits and will report the estimated number of trees removed for personal firewood. This information is to be provided to the FWS no later than March 1 following the end of the previous fiscal year. Monitoring the above activities will be implemented as follows:

   The FS will conduct and report normal inspections of projects such as, prescribed burns, and personal firewood programs to ensure that the management prescriptions and forestwide standards outlined in the 2013 Revised GWLRMP have been implemented. Timber sale administrators will conduct normal inspections of all timber sales to administer provisions for protecting residual trees (residual trees are those trees not designated for cutting under provisions of the timber sale contract). Unnecessary damage to residual trees will be documented in sale inspection reports and proper contractual or legal remedies will be taken. The FS will include this information in their annual monitoring reports to the FWS.

3. The FS shall provide all required monitoring reports and any other additional information to the FWS in digital format at the following address:

   Sumalee Hoskin
   Virginia Field Office
   U.S. Fish and Wildlife Service
   6669 Short Lane
   Gloucester, Virginia 23061
   Phone: (804) 693-6694
   Fax: (804) 693-9032
   sumalee hoskin@fws.gov

4. Care must be taken in handling any dead specimens of proposed or listed species to preserve biological material in the best possible state. In conjunction with the preservation of any dead specimens, the

finder has the responsibility to ensure that evidence intrinsic to determining the cause of death of the specimen is not unnecessarily disturbed. The finding of dead specimens does not imply enforcement proceedings pursuant to the ESA. The reporting of dead specimens is required to enable the FWS to determine if take is reached or exceeded and to ensure that the terms and conditions are appropriate and effective. Upon locating a dead specimen, notify the FWS's Virginia Law Enforcement Office at 804-771-2883, 5721 South Laburnum Avenue, Richmond, Virginia 23231, and the FWS's Virginia Field Office at 804-693-6694 at the address above.

The FWS believes that no more than 23,513 acres of potential Indiana bat habitat will be disturbed and no more than seven Indiana bats will be incidentally taken on an annual basis as a result of the proposed action. The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise result from the proposed action. If, during the course of the action, this level of incidental take is exceeded, as measured by the total amount of habitat disturbance or the number of injured or dead Indiana bats, such incidental take represents new information requiring reinitiation of consultation and review of the reasonable and prudent measures provided. The Federal agency must immediately provide an explanation of the causes of the taking and review with the FWS the need for possible modification of the reasonable and prudent measures.