FOREST-WIDE DIRECTION

CHAPTER 2

INTRODUCTION

The Forest Plan is a strategic document providing land allocations, goals, desired conditions, objectives, and standards. This chapter outlines the forest-wide management direction for the Jefferson National Forest within the context of the Southern Appalachians. The Jefferson National Forest is one piece of the Southern Appalachian ecosystem. The goals for management of the Jefferson National Forest are consistent with the other national forests of the Southern Appalachians and consider the conditions and influences of other private and public lands in this region.

This direction is organized around the physical, biological, and social resources of the Forest, as well as the major issues identified by the citizens who helped develop this Forest Plan. Each resource discussion includes broad goal statements, which describe desired conditions we want to maintain, restore or achieve in the future. Objectives express measurable steps we will take over the next ten years on the pathway to achieve our goals. Objectives may be accomplished by maintaining the desired condition or by implementing a project or activity designed to restore or achieve the desired condition. Not all goals require quantifiable objectives. Objectives are linked to the Forest Monitoring Plan.

While goals and objectives define where we are headed with management of the Jefferson 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.

Specific projects designed to implement this strategic direction are proposed, designed, carried out, and monitored by an interdisciplinary team of resource specialists. Deviation from a standard requires a Forest Plan amendment. Adherence to Forest Plan standards is monitored during project implementation. In addition to the standards found in the Plan, the Jefferson is required to comply with applicable laws, executive orders, and regulations (see Appendix A). Manuals, handbooks, new scientific information, and on-the-ground conditions are followed and considered during site-specific project analysis.

Forest-wide goals, objectives, and standards apply to the entire Jefferson National Forest unless superseded by specific management prescription direction. When a management prescription is silent regarding a specific resource activity, the forest-wide direction applies. Desired conditions, objectives, and standards may also be found at the management prescription (Chapter 3) and management area (Chapter 4) levels of this Plan.

Any decisions on projects to implement the Revised Plan are based on site-specific analysis in compliance with the National Environmental Policy Act (NEPA). This environmental analysis is appropriately documented 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). Projects are evaluated to determine if they are consistent with the management direction in the Revised Plan. This evaluation is documented in the project-level environmental document with a finding of consistency incorporated into the decision document.

WATERSHEDS

WATERSHEDS - WATER, SOIL, AIR, AND AQUATIC SPECIES

The lands known today as the Jefferson National Forest could hardly have been called a "forest" in 1936. Repeated wildfires, clearing of steep mountain land for farming and grazing, iron ore mining, and widespread, indiscriminate logging led to severe erosion and increased flooding. As a result, by the early 1900's, much of the higher elevation mountains and ridges in southwestern Virginia had been transformed into charred 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,"* through the Weeks Law. In 1936, as a result of this Act, the Jefferson National Forest was established from these "lands nobody wanted."

We intend to continue the tradition of watershed restoration, protection and stewardship begun on this national forest over 65 years ago. Maintenance and restoration of healthy, diverse, and resilient watersheds, which include not only the water, but also the soil and air, will be given the highest priority in all of our management activities. Watershed, riparian, and aquatic species protection goals, objectives, desired conditions, and standards do not vary across the Forest. We do not have more or less stringent standards in one area versus another.

[1] Watershed Condition Ranking is explained in Chapter 3 of the FEIS.

Priority Watersheds

Priority watersheds were selected because they either have a below average Watershed Condition Ranking[1] (WCR), impaired stream segments (Table 2-1) or outstanding aquatic

Table 2-1. Priority Watersheds with Below Average WCR or Impaired Rivers or Streams

Watershed Code	Watershed Name	Impaired Rivers / Streams or Below Average WCR
02080203010-H01	James River/Reed Creek	Reed Creek
02080201090-I28	James River/Elk Creek/Cedar Creek	James River
03010101020	Roanoke River/Glade Creek	Below Average WCR
05050001060	New River/Pounds Mill Branch	Below Average WCR
05050001070 05050001070-N09	Cripple Creek	Cripple Creek and Below Average WCR
05050001080	Reed Creek	Below Average WCR
05050001100 05050001100-N17	New River/Peak Creek	Peak Creek and Below Average WCR
05050002030-N31	Hunting Camp Creek	Hunting Camp Creek
05070202050-Q13	Pound River	N. and S. Forks of Pound
06010102020	Middle Fork Holston	Below Average WCR
06010205040 06010205040-P11	Clinch River/Guest River	Crab Orchard, Yellow, Tom & Little Tom, and Sepulcher Creeks, Guest River and Below Average WCR
06010205050	Lower Clinch River	Below Average WCR
06010206010	Powell River	Below Average WCR

WATERSHEDS

biodiversity (Table 2-2) in close proximity to the Jefferson National Forest, where forest management actions may make a difference. Although water quality continues to improve on National Forest System lands, downstream from the Forest, several rivers and streams are identified by the Commonwealth of Virginia as impaired. Physical, chemical and biological considerations determine whether waters are listed as impaired. Fecal coliform, sediment or other water quality conditions caused by past or current activities contribute to impairment. The sources of impairment and frequently the rare aquatic species in these watersheds actually occur outside of national forest ownership. These watersheds will be priorities for watershed assessments, including additional inventory and monitoring beyond what is required in this Forest Plan and project-specific plans.

Table 2-2. Priority Watersheds which Possess Outstanding Aquatic Biodiversity

Watershed Code	Watershed Name	Rare Aquatic Species
02080201030-I10	Upper Potts Creek	James spinymussel
02080201080-I19	Upper Craig Creek	Orangefin Madtom
02080201080-I21	Johns Creek	Orangefin madtom, Atlantic pigtoe mussel, and James spinymussel
02080201080-I22	Lower Craig Creek/Patterson Creek/Lower Barbours Creek	Orangefin madtom, Atlantic pigtoe mussel, and James spinymussel
02080201090-I27	James River/Jennings Creek	James spinymussel
02080201090-I28	James River/Elk Creek/Cedar Creek	Atlantic pigtoe mussel and James spinymussel
05050002030-N30	Wolf Creek	Elktoe and Tennessee heelsplitter mussels, and candy darter
06010205040-P09	Clinch River/Little Stony Creek	Tippecanoe darter, emerald and steelcolor shiners, and many species of mussels
06010205050-P13	Clinch River/Stock Creek/Cove Creek	Tippecanoe darter, emerald and steelcolor shiners, paddlefish, and many species of mussels
05050002010-N28	Stony Creek	Candy darter
05050002020-N26	Kimberling Creek	Candy darter and green floater
05050001050-N03	Fox Creek	Kanawha minnow
06010101010-O10	North Fork Holston River/Laurel Creek	Tennessee dace
06010101010-O09	Upper North Fork Holston River	Tennessee dace, longhead darter, little-wing pearlymussel, slippershell, and slabside pearlymussel
06010102010-O02	South Fork Holston River/ Whitetop Laurel Creek	Tennessee dace, sharphead and greenfin darters, little-wing pearlymussel and slabside pearlymussel
06010102020-O03	Upper Middle Fork Holston River	Tennessee dace, Tennessee heelsplitter
06010102020-O04	Middle Fork Holston River/Hungry Mother Creek	Tennessee dace, tan riffleshell, Tennessee heelsplitter, cracking, little-wing pearlymussel, and slabside pearlymussel

WATERSHEDS

Within these watersheds, we will seek opportunities for dialog with adjacent private landowners and work collaboratively with local governments and other Federal government agencies to restore water quality or maintain and restore aquatic habitat. In addition to identification of these priority watersheds, the Forest has developed a Federally Listed Fish and Mussel Conservation Plan in collaboration with the U.S. Fish and Wildlife Service, and continues to work with the Virginia Department of Game and Inland Fisheries to protect and recover federally listed and sensitive aquatic species.

Priority Watershed activities will include: 1) public education and awareness; 2) new partnerships and coordinating efforts; 3) information collection through monitoring and research; 4) establishment of plans and priorities; 5) funding and technical assistance; 6) implementation of solutions; and 7) evaluation of results.

Reference Watersheds

Watershed assessments are predicated on our ability to define, measure, and compare the relative physical, chemical, and biological integrity between similar systems. Relatively undisturbed watersheds, or reference watersheds, form the basis for developing integrity criteria. The Jefferson National Forest has identified eight reference watersheds representing each of the ecological sub-sections of the Forest. The streams within these small (300-2400 acres) watersheds have existing water quality conditions considered to be the "best attainable" for the ecological sub-section under relatively undisturbed, natural situations. Management prescription 9A2 in Chapter 3 contains the desired condition and standards for these reference watersheds.

Aquatic Species

The Jefferson National Forest has approximately 300 miles of streams which support a cold-water fishery and about 230 miles of streams that support a cool- or warm-water fishery. In addition, the Forest has about 350 acres of lakes, ponds, and reservoirs greater than one acre. Aquatic macroinvertebrates integrate the physical, chemical, and biological components of the riparian ecosystem and will be used as biological indicators of change and impacts to aquatic ecosystems.

The aquatic threatened and endangered species list on the Jefferson National Forest includes 24 species, as well as two species that are candidates for federal listing. All but 4 of these species are found downstream of National Forest System (NFS) lands. Forest Plan objectives have been developed for federally-listed species located in drainages immediately adjacent to NFS ownership: blackside dace, Cumberland johnny darter, dromedary pearlymussel, little-wing pearlymussel, all found in the Poor Fork Cumberland watershed. Although the James spinymussel was confirmed at one location on the Jefferson in 1990, no live specimens have been found in subsequent surveys.

Instream Flows

Nonconsumptive water uses are those that do not consume or remove water from a waterbody. These include instream flows for streams and water levels in lakes and reservoirs. Instream flows are necessary to fulfill the purposes for which the Jefferson National Forest was created and to meet the intent of applicable laws and regulations. These purposes include favorable conditions of water flow, fish and wildlife, recreation, and aesthetics.

Instream flows are also needed in adequate quantities to support the beneficial uses designated by the State. Commonly listed beneficial uses (known as designated uses in some States) for nonconsumptive purposes include recreation, fish and wildlife, and aquatic life. Specifically, Virginia's Water Quality Standards state “...man-made alterations in stream flow shall not contravene designated uses including protection of the

propagation and growth of aquatic life."

Soils

Soils are complex mixtures of minerals, organic compounds, and living organisms. Time, climate, macro- and micro-organisms, vegetation and topography modify the parent materials present in the surface geology of an area to slowly develop the soil system. The Jefferson National Forest works in cooperation with the Natural Resources Conservation Service to keep our detailed soil inventory up-to-date. Soil productivity is sustained through nitrogen and carbon fixation, mineral release from weathering parent material, decaying organic matter, and translocation of nutrients. Erosion and compaction can affect long- and short-term soil productivity. Soil productivity improvement opportunities include abandoned mining areas, new land acquisitions, eroding roads and trails, impacted riparian areas, and watershed restoration areas.

Air Quality

Air pollution is having negative effects on the watersheds of the Jefferson National Forest. Sulfur compounds in the atmosphere are primarily responsible for the haze that obscures visibility. Sulfur compounds and sometimes nitrogen compounds cause acidification of headwater streams and can cause nutrients to leach out of soils. Ozone causes visible injury to plant leaves, and can also cause reduced plant growth. Because the pollutants originate from many sources over a wide geographic area, regional approaches to air pollution emission reductions are necessary to improve air quality and resource conditions. It is essential that the Forest work cooperatively with air management agencies, Visibility Improvement State and Tribal Association of the Southeast (VISTAS), and other regional planning organizations in order to reduce air pollution impacts to resources on the Forest. Air quality is also addressed (directly or indirectly) in this Forest Plan under aquatic species, wilderness, forest health, and fire management.

GOALS AND OBJECTIVES

GOAL 1 Manage watersheds to maintain or restore resilient and stable conditions to support the quality and quantity of water necessary to protect ecological functions and support beneficial water uses. Instream flows (or lake levels) provide the amounts necessary to: 1) maintain the capacity of the channels to transport water and sediment; 2) protect aquatic organisms; 3) sustain or restore riparian habitats and communities; and 4) provide for recreation, scenic, aesthetic, and research purposes.

OBJECTIVE 1.01 Maintain or restore temperature, balance of water and sediment, chemical resilience, and biological integrity of all streams. (see also Objective 3.01).

OBJECTIVE 1.02 Conduct watershed analysis annually as funding permits. Priority is given to watersheds listed in Tables 2-1 and 2-2. As part of the analysis, surveys will be conducted to identify sources of impairment from National Forests lands and appropriate treatments will be developed.

WATERSHEDS

OBJECTIVE 1.03 The instream flows needed to protect stream processes, aquatic and riparian habitats and communities, and recreation and aesthetic values will be determined on selected streams as identified by the Forest.

GOAL 2 Manage and restore riparian ecosystems, wetlands and aquatic systems to protect and maintain their soil, water, vegetation, fish, wildlife, and other resources. Channeled ephemeral streams maintain their ability to filter sediment from upslope disturbances while achieving the goals of the adjacent management prescription area.

OBJECTIVE 2.01 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).

GOAL 3 Aquatic habitat conditions are suitable to maintain aquatic species native to the planning area, and to support desirable levels of selected species (e.g., species with special habitat needs, species commonly fished, or species of special interest).

OBJECTIVE 3.01 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.

OBJECTIVE 3.02 Maintain a stable and/or increasing population trend for Blackside dace and James River spiny mussel.

GOAL 4 Manage soils to maintain or improve their productivity and to not contribute sediment to streams at levels which negatively effect instream uses and lifecycles of aquatic species.

OBJECTIVE 4.01 Improve watershed and soil conditions across 600 acres per decade. Priority for treatment will be given to watersheds listed in Tables 2-1 and 2-2 and areas identified in the Watershed Improvement Needs inventory.

GOAL 5 Reduce air pollution impacts to forest ecosystems and watersheds.

OBJECTIVE 5.01 The condition of forest resources potentially affected by air pollution improves in watersheds currently being negatively impacted.

[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.

STANDARDS

Water and Soil Quality

FW-1: Resource management activities that may affect soil and/or water quality follow Virginia, West Virginia, and Kentucky 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 or lakes, determine the instream flow or lake 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) or lakes 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[2] and revegetation is accomplished within 5 years.

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: To limit soil compaction, no heavy equipment is used on plastic soils when the water table is within 12 inches of the surface, or when soil moisture exceeds the plastic limit. Soil moisture exceeds the plastic limit when soil can be rolled to pencil size without breaking or crumbling.

FW-9: Heavy equipment is operated so that soil indentations, ruts, or furrows are aligned on the contour and the slope of such indentations is 5 percent or less.

FW-10: Management activities that cause bare mineral soil on slopes greater than 5% will have erosion control planned and implemented.

[2] Activity area is the area of potential soil disturbance expected to produce vegetation in the future, for example: timber harvest units, prescribed burn areas, grazing allotment, etc.

Air Quality

Standards for air quality related to wildland fire and prescribed fire are found in the Fire Management section of Chapter 2.

FW-11: 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 11 in Chapter 3. See Appendix C for the definitions of riparian areas and corridors.

WATERSHEDS

Channeled Ephemeral Zones

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

FW-12: 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-13: Management activities expose no more than 10% mineral soil in the channeled ephemeral zone.

FW-14: 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-15: 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-16: At least partial suspension is required when yarding logs over channeled ephemerals.

FW-17: The removal of large woody debris is allowed if it poses 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-18: The addition of large woody debris in channeled ephemeral reaches will primary be through passive recruitment rather than active placement.

FW-19: New human-constructed impoundments are allowed on a case-by-case basis, following evaluation of downstream instream flow needs.

FW-20: When crossing channeled ephemeral streams, culverts, temporary bridges, hardened fords, or corduroy are used where needed to protect channel or bank stability.

FW-21: 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-22: If culverts are removed, banks and channel must be restored to a natural size and shape. All disturbed soil must be stabilized.

FW-23: 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-24: New non-motorized trail construction is allowed to improve existing trail configuration and improve access.

FW-25: 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-26: Motorized and non-motorized trail reconstruction and relocation within the channeled ephemeral zone are allowed to reduce impacts to riparian and aquatic resources.

FW-27: 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-28: 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-29: During prescribed fire operations in the channeled ephemeral zone, use the least ground disturbing method of fireline construction, favoring blacklines and handtools.

FW-30: 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-31: Revegetate and waterbar firelines as quickly as possible, where necessary to prevent erosion. Use water diversions to keep sediment out of channels.

Aquatic Species Management

See Riparian Corridor Management Prescription 11 in Chapter 3 for aquatic species management direction.

WILDLIFE AND THREATENED, ENDANGERED AND SENSITIVE SPECIES

WILDLIFE AND THREATENED, ENDANGERED, AND SENSITIVE SPECIES HABITAT

The Jefferson National Forest is charged with creating and maintaining habitat conditions suitable to maintain viable populations of all species native to the planning area, and where appropriate support desirable levels of selected species. As described in Chapter 3, mixes of management prescriptions are allocated to provide for a variety of habitat conditions. The goals, objectives and standards in this section are designed to protect, restore, maintain, and enhance wildlife and plant populations and communities while maintaining flexibility to manage other resources.

Some species depend on early successional forests, while others depend on late successional forests. Similarly, some species depend on a forest structure that is more open while other species depend on a more closed canopy forest. Generally speaking, the forests that are more open with an early successional component have a more frequent disturbance regime while those with more of a late successional component and more of a closed canopy overstory have a disturbance regime that is more infrequent and at a smaller spatial scale. It is important that we provide this range of habitat conditions across the landscapes of the national forest. Early and late successional forests are generally reciprocal—more early successional forests mean less late successional forest, and vice versa—if they are both to be maintained long-term on the landscape.

Most early successional forest conditions are temporary. Ten years after a natural or managed disturbance, forests mature into saplings and poles. At approximately 40 years of age, forests are considered mid successional, with late successional habitat conditions appearing at 70 to 120 years of age depending on the forest community type.

Examples of forest communities that can provide these open, early successional conditions are the xeric pine, pine-oak woodlands, and dry oak forests. These typically occur on hot, dry south to west facing slopes and ridge crests. Forest communities with more closed, late successional conditions are mesic oak forests and mixed cove forests. These are typically found on cool, moist north to east facing slopes, coves, and riparian areas.

Some forest communities can provide both early successional forest conditions and mid- to late successional conditions at the same time. Open pine, xeric pine-oak savannahs and xeric open oak woodlands provide elements of both in the same forest and are generally found on west, southwest, and southern facing slopes of ridges.

Recent research using dendrochronology and fire scar dating indicates a fire-return interval of approximately 7 to 12 years in the drier pine and oak woodlands at least from the 1700s until the 1930s, when active fire-suppression became widespread and the norm in forest management. Fire-return intervals at this rate would create a more open mid to late successional forest, with fewer trees per acre and a more grassy/shrubby understory than is currently seen today. This open oak-pine, savannah-like, woodland is now largely missing from the landscape due to fire suppression and subsequent forest succession that has favored shade tolerant and fire intolerant species to now dominate. Restoring and maintaining open forest woodland that is now in decline provides important habitat conditions for supporting federally listed threatened and endangered species such as Indiana bat and other high priority species in need of conservation attention such as Appalachian yellow-bellied sapsucker and golden-winged warbler. In addition, restoration of disturbance management will favor restoration of table mountain and pitch pine plant communities, both now in steep decline across their natural range.

Permanent grass/forb and seedling/sapling/shrub habitats are also important elements of early successional habitats. Wildlife openings are permanent openings maintained for

wildlife habitat on an annual or semi-annual basis with the use of mowing, burning, livestock grazing, herbicides and/or cultivation. Old fields are openings that are maintained on a less frequent basis (5-10 year intervals). Pastures and maintained rights-of-way can also provide a type of permanent early successional habitat.

This Forest Plan is designed to strike a balance across the entire range of habitat conditions. Objectives for percent of the forest desired in early, mid, and late successional conditions are included in individual management prescriptions. The early successional objectives apply only to temporary early successional forest patches 2 acres in size or greater. Permanent grass/forb and seedling/sapling/shrub habitats, old fields, pastures, maintained rights-of-way, open woodland habitats, and canopy gaps less than 2 acres in size provide a different habitat condition and are considered separately. With the exception of canopy gaps, presence of these other types is meant to supplement early successional forest objectives in determining overall abundance of early-successional habitats across the Forest. Percentage objectives apply to all forested land, not just acreage suitable for timber production or harvest. Conditions of surrounding private lands are not included in objectives, but are considered during project-level planning. For example, high amounts of quality early successional forest on surrounding private land might result in a decision to provide such habitat on national forest land at the low end of the objective range.

The Forest will work with neighboring landowners to encourage maintenance of forest as a land use on private lands within and surrounding the Forest through agreements, land trusts, and education. Acquisition and exchange of adjacent lands are considered where they would contribute to the contiguous landscape needs, particularly for rare species. The Forest will also contribute to public knowledge and understanding of biological conservation issues, strategies, and activities.

Early successional forest patches created by natural disturbances are also considered during project-level planning, but no attempt has been or need be made to predict amounts of early successional forest likely to be created by natural events in the future. Even-aged regeneration cutting, including two-aged or coppice with reserves, counts as early successional forest habitat. Areas managed under uneven-aged regeneration cutting are designed to provide canopy gaps present in mid or late successional forest and therefore do not contribute to early successional habitat objectives.

Open road density for a contiguous management prescription block is calculated by converting the acres within the allocation into square miles (total acres/640 acres) and then dividing that figure into the linear measure of open roads within the prescription. Open roads forming the boundary of a contiguous management prescription block contribute half of their length to open road density calculations. An open road is a motorized travelway (including designated motorized trails) used on a regular basis.

Calculations to determine forest plan compliance for percent of early or late successional habitats, as well as road density, during project planning will be done on the basis of geographically contiguous management prescription blocks. Management prescription blocks of less than 1,000 contiguous acres can be lumped with nearby prescriptions having the same successional stage objectives. To meet objectives for mid and late successional forest habitats, it is important that planned vegetation management treatments (timber harvesting or prescribed burning) do not fall below the minimum objective levels prescribed in individual management prescriptions.

WILDLIFE AND THREATENED, ENDANGERED, AND SENSITIVE SPECIES

Management Indicator Species

Management Indicator Species (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. Specific habitat objectives related to these species are located in several places throughout this Forest Plan. Table 2-3 provides a guide for locating these objectives. The monitoring program outlined in Chapter 5 contains specific objectives for these management indicator species.

Threatened, Endangered, Sensitive Species (T/E/S)

The Forest contains, or may influence, habitat that supports 35 federally listed (4 mammals, 1 bird, 5 vascular plants, 6 fish, and 19 mussels), over 100 Regional Forester's sensitive, and numerous locally rare plant and animal species. For federally listed species, the Forest coordinates closely with the U.S. Fish and Wildlife Service to avoid negative effects and to assist with recovery. Sensitive species are those with range-wide viability concerns that are designated by the Regional Forester, with the goal of not having them become federally listed. Locally rare species are those species determined at the Forest level due to concerns about losing representation of that species on the Forest, even though they are secure range-wide. All the lists change with time as species are added or deleted.

Objectives for recovery of eight federally listed species that are known to exist on the Jefferson National Forest are provided in this section and under the Watersheds - Water, Soil, Air, and Aquatic Species section of this Chapter.

Table 2-3. Management Indicator Species

Species Common Name	Category (s)	Related Objectives or Management Prescription (Rx) or Desired Condition (DC)
Peaks of Otter Salamander	T/E/S Indicator, Special Interest Species Indicator	9.03, 12.03, Rx 8E2 Desired Condition (DC)
Pileated Woodpecker	Special Habitat Indicator	12.03, 13.01, Rx 8A1-OBJ2, Rx 8B-OBJ2, Rx 8C-OBJ2, Rx 8E1-OBJ2
Ovenbird	Special Habitat Indicator	7.01, 12.03, 13.01
Chestnut-sided Warbler	Special Habitat Indicator	7.02, Rx 4K3-OBJ1, and Rx 4K4-OBJ1
Acadian Flycatcher	Special Habitat Indicator	2.01, Rx 11 DC
Hooded Warbler	Biological Community Indicator	7.01., 12.03, 12.05, 18.03, Rx 8A1-OBJ1, Rx 8A1-OBJ2, Rx 8B-OBJ2, Rx 8C-OBJ1, Rx 8C-OBJ2
Scarlet Tanager	Biological Community Indicator	7.01, 12.02, 12.05, 18.02, 18.03, Rx 8A1-OBJ1, Rx 8C-OBJ1
Pine Warbler	Biological Community Indicator	12.02, 12.05, 18.02, 18.03
Eastern Towhee	Biological Community Indicator	12.02, 12.05, 18.02, 18.03, Rx 8A1-OBJ3, Rx 8B-OBJ1, Rx 8C-OBJ1, Rx 8C-OBJ3, Rx 8E1-OBJ1, Rx 8E1-OBJ3
Wild Trout	Biological Community Indicator, Demand Species Indicator	1.01, 1.03, 2.01, 3.01, 5.01, Rx 11 DC
Eastern Wild Turkey	Demand Species Indicator	12.02, 12.03, 12.05, 18.02, 18.03, Rx 8A1 DC
Black Bear	Demand Species Indicator	8.01, 12.02, 12.03, 12.05, 18.02, 18.03, Rx 8C DC
Deer	Demand Species Indicator	12.02, 12.03, 12.05, 18.02, 18.03, Rx 8B DC

GOALS AND OBJECTIVES

GOAL 6 Maintain and restore natural communities in amounts, arrangements, and conditions capable of supporting native and desired non-native species within the planning area. Provide quality wildlife-based recreational opportunities to the public, including hunting, fishing, and wildlife viewing.

See Objectives for Riparian ecosystems (Goal 2), Aquatic habitats (Goal 3), Vegetation Goal 12), Old Growth (Goal 13), and Fire (Goal 18) related to this Goal.

GOAL 7 Provide breeding, wintering, migration, staging and stop-over habitat for migratory birds in ways that contribute to their long-term conservation.

OBJECTIVE 7.01 Implement 400-600 acres of habitat improvement treatments per year to increase structural diversity for migratory birds in mid to late successional mixed mesophytic, northern hardwood, mesic oak forests, or xeric oak and oak-pine woodlands. (See also Objectives 12.02, 12.03, 12.05, 18.02, and 18.03.)

OBJECTIVE 7.02 Maintain and restore approximately 2,500 acres above 2800 feet elevation in early successional habitats to provide habitat for high-elevation, early successional migratory bird species over the planning period. (See also Objectives 4K3-OBJ1, and 4K4-OBJ1.)

GOAL 8 Maintain or increase habitats for those species needing large, contiguous forested landscapes, especially where such conditions are not found on other lands within the landscape.

OBJECTIVE 8.01 To provide areas with low levels of human disturbance, maintain approximately 252,000 acres under conditions where open road density is less than 0.8 miles per square mile, and off-road vehicle use is restricted throughout the year. Maintain at least 2,400 of these acres in early successional habitat. (See Management Prescription 8C.)

GOAL 9 Contribute to the conservation and recovery of federally listed threatened and endangered species, and contribute to avoiding federal listing of other species under the Endangered Species Act.

OBJECTIVE 9.01 Maintain a stable and/or increasing population trend for the **northern flying squirrel** through protection, maintenance and restoration of high elevation spruce-fir and northern hardwood forest communities. (See Management Prescriptions 4K3 and 4K4.)

WILDLIFE AND THREATENED, ENDANGERED, AND SENSITIVE SPECIES

OBJECTIVE 9.02 Maintain a stable and/or increasing population trend for the **Indiana bat** through protection and proactive management of Cave Protection Areas. (See Management Prescription 8E4.)

OBJECTIVE 9.03 Maintain a stable and/or increasing population trend for the **Peaks of Otter salamander** over the planning period through protection and maintenance of the Habitat Conservation Area. (See Management Prescription 8E2.)

OBJECTIVE 9.04 Maintain the current number of populations/ occurrences of **northeastern bulrush**, **Virginia spirea** and **small-whorled pogonia** through protection and maintenance of existing sites. (See Management Prescriptions 4D and 9F.)

OBJECTIVE 9.05 Increase the number of populations/occurrences of **Virginia round-leaf birch** with the assistance of reintroduction and propagation efforts. (See Management Prescription 4D.)

STANDARDS:

Wildlife Management

FW-32: 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-33: Potential black bear den trees will be retained during all vegetation management treatments. Potential den trees are those that are greater than 20" diameter breast height. Potential den trees also include those that are hollow with broken tops or those with limbs greater than 12 inches diameter broken near the bole of the tree.

T/E/S Species Management

FW-34: 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-35: 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-36: Do not issue permits for collection of threatened, endangered, sensitive, and locally rare species, except for approved scientific purposes.

Bald Eagle Management

FW-37: Delineate and maintain 1,500 foot protection zones around all bald eagle nest and communal roost sites until they are determined no longer suitable. Management activities that modify the forest canopy within this zone are designed to be compatible with recovery of this species.

Peregrine Falcon Management

FW-38: Post and enforce seasonal closure orders near active peregrine falcon nests during season of use to control human disturbance.

Northern Flying Squirrel Management

FW-39: Northern hardwood forests within ½ mile of known occupancy of northern flying squirrels are not modified by management actions unless compatible with recovery of this species.

FW-40: Known occurrences of the northern flying squirrel are allocated to Management Prescriptions 4K3 and 4K4 to ensure protection and maintenance of their current populations and surrounding habitat conditions. (See Chapter 3 for these Management Prescriptions for additional management direction related to the northern flying squirrel.)

Management of Federally-listed Plants

FW-41: Known occurrences of Virginia spirea, small-whorled pogonia, northeastern bulrush, and Virginia round-leaf birch are allocated to Management Prescriptions 4D or 9F to ensure protection and maintenance of their current populations and surrounding habitat conditions.

FW-42: Continue cooperative efforts to contribute to the recovery of Peters Mountain mallow where it occurs on non-Forest Service lands.

Peaks of Otter Salamander Management

FW-43: Known occurrences of the Peaks of Otter salamander are allocated to Management Prescription 8E2 to ensure protection and maintenance of current populations and surrounding habitat conditions. (See Chapter 3 for this Management Prescription for desired condition and standards for protection of the Peaks of Otter salamander.)

Gray Bat and Virginia Big-Eared Bat Management

FW-44: Maintain a ¼ mile buffer of undisturbed forest around gray bat maternity and hibernation colony sites and Virginia big-eared bat maternity, bachelor, or winter colony sites. Prohibited activities within this buffer include cutting of overstory vegetation, construction of roads, trails, or wildlife openings, and prescribed burning. Exceptions may be made when compatible with recovery of these species.

WILDLIFE AND THREATENED, ENDANGERED, AND SENSITIVE SPECIES

Indiana Bat Management

FW-45: Each Indiana bat hibernaculum has a **primary and secondary cave protection** area managed according to management prescription 8E4. If additional hibernacula are found, the desired condition and standards of management prescription 8E4 apply until an environmental analysis to consider amendment to the Forest Plan is completed.

FW-46: 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 d.b.h.[3] and larger, 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 d.b.h. 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 d.b.h. with priority given to the largest available trees, which exhibit characteristics favored as roost trees by Indiana bats.

FW-47: To insure a continuous supply of **roost trees and foraging habitat**, the following forest-wide conditions must be maintained:

- Minimum of 60% of the combined acreage of all CISC[4] Forest Types on the Forest will be maintained over 70 years of age; AND
- Minimum of 40% of the combined acreage of all CISC 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-48: 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-49: No disturbance that will result in the potential taking[5] of an Indiana bat will occur within this active roost tree buffer.

- Commercial timber harvesting, road construction, and use of the insecticide diflubenzuron 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

[3] d.b.h. Diameter Breast Height. See Glossary in Appendix B for definition.

[4] CISC Continuous Inventory of Stand Conditions. See Glossary in Appendix B for definition.

[5] The term "take" is 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 collecting. "Harm," in turn, may include significant habitat modification or degradation where it actually kills or injures a listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering.

they will not result in a potential taking of an Indiana bat.

FW-50: Removal of known Indiana bat **active roost trees** will be avoided, except as specified in the next 2 standards.

FW-51: 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-52: 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-53: 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 of active maternity roosting sites between June 1 and August 1 is prohibited.

FW-54: 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-55: If **active maternity roost sites** are identified on the Forest, they will be protected with a 2-mile buffer defined by the maternity roost, alternate roost sites, and adjacent foraging areas.

FW-56: 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 pesticides is 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-57: If during project implementation, **active maternity roost sites** are identified, all project activity will cease within a 2-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-58: 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 made available to the U.S. Fish and Wildlife Service, if requested.

WILDLIFE THREATENED, ENDANGERED, AND SENSITIVE SPECIES

- 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-59: 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-60: Develop informational and educational displays about bats to inform the public about this misunderstood group of mammals.

RARE COMMUNITIES

RARE COMMUNITIES

Rare communities are assemblages of plants and animals that occupy a small portion of the landscape, but contribute significantly to plant and animal diversity. They generally are characterized by relatively discrete boundaries and are small in area. Rare communities are frequently associated with areas of unusual geology or hydrology. Because of their importance to biological diversity and the small area affected, maintenance and restoration of these areas, as well as inventory and monitoring are a high priority. Acquisition of lands containing sites critical to the conservation of rare communities is a priority.

Table 2-4. Rare Communities Found On The Jefferson National Forest

Rare Community Names	
A. Wetland Communities	**D. Cliffs and Rock Outcrops**
1. Bogs, Fens, and Seeps	1. Talus Slopes
2. Limesink, Karst, and Depression Ponds	2. Forested Boulderfields
3. Riverine Vegetation	3. Acid Cliffs
	4. Alkaline Cliffs
B. Glades, Barrens, and Associated Woodlands	5. Spray Cliffs
1. Calcareous Woodlands and Glades	6. Northern White Cedar Bluffs
2. Carbonate Glades and Barrens	7. Rock Houses
3. Sandstone Glades and Barrens	8. Granitic Domes
4. Shale Glades and Barrens	9. Granitic Flatrock
5. Serpentine Woodlands	
6. Mafic Glades and Barrens	**E. Other Communities**
	1. Grassy Balds
C. Forest Communities	2. Shrub Balds
1. Carolina Hemlock Forests	3. Rocky Summits
2. Table Mountain Pine Woodlands	4. Patch Prairies and Grasslands
3. Spruce-Fir Forests	5. Canebrakes
4. Beech Gap Forests	6. Caves
5. Basic Mesic Forests	

Rare communities have been identified on the Jefferson National Forest through a series of inventories completed in cooperation between the Forest Service and Virginia Natural Heritage Program. Several reports have resulted from this cooperative work which describe the communities, elements of occurrence within them, and management recommendations. We will continue to work closely with the Virginia Natural Heritage Program to identify and protect newly discovered rare communities.

Ideal stewardship of these of rare communities would allow natural processes to proceed unencumbered, however, in some cases, the prevailing environmental conditions have changed so as to prevent ,or at least hinder, natural processes. Reintroduction of fire and control of non-native diseases, insects, plants, and other competitors require special management strategies. Rare communities are managed under the 9F (Rare Community) Management Prescription. Appendix E contains detailed descriptions of these rare communities.

Significant Caves

The Federal Cave Resources Protection Act of 1988 (16 U.S.C. 4301-4309) is intended to protect significant caves on federal lands by identifying their location, regulating their use, requiring permits for removal of their resources, and prohibiting destructive acts. The Act requires that caves be considered in the preparation and implementation of land management plans, and allows for cave location to be kept confidential. The Jefferson National Forest has designated 4 caves as significant: Shire's and Miller's Cove Caves on the New Castle Ranger District and Kelly and Rocky Hollow Caves on the Clinch Ranger District. Criteria for evaluating additional caves as significant are described in Appendix H.

GOALS AND OBJECTIVES:

GOAL 10 Maintain and restore rare communities found on Jefferson National Forest lands.

Objectives related to this goal are found under the Vegetation and Fire sections of this Chapter.

GOAL 11 Protect and manage significant and potentially significant caves in accordance with the Federal Cave Resources Protection Act of 1988, which protects their location.

OBJECTIVE 11.01 Evaluate 10 Forest caves over the planning period using the rating system in Appendix H of the Revised Plan. Use the assigned significance values to determine cave classification and to determine cave significance under the implementation regulations of the Federal Cave Resources Protection Act of 1988.

STANDARDS

Rare Communities

FW-61: In cooperation with the States' Natural Heritage agencies, make appropriate adjustments to Management Prescription 9F through the Forest Plan amendment process as new rare community information becomes available.

FW-62: Maintain records of rare community locations and conditions across the

RARE COMMUNITIES

forest. Survey project areas for rare communities prior to implementing projects that have the potential to negatively affect them.

VEGETATION, OLD GROWTH, AND FOREST HEALTH

Caves

FW-63: A minimum of 200 foot buffers are maintained around cave entrances, sinkholes, and cave collapse areas known to open into a cave's drainage system. 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. Perennial, intermittent, channeled ephemeral stream standards will apply beyond the first 200 feet.

FW-64: 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-65: 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-66: 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-67: 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-68: 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-69: The specific location of a **significant cave** 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.

VEGETATION, OLD GROWTH AND FOREST HEALTH

Major forest communities occupy the vast majority of the Jefferson National Forest landscape. Their distribution, abundance, and condition are critical elements of providing for a diversity of plant and animal communities; however, because they are widespread, they necessarily will be managed in a variety of ways across the landscape, depending on the management prescription in which each is located.

Table 2-5 shows the major forest community types that exist on the Jefferson National Forest. Each major forest community type is described by its relationship with the Southern Region Forest Types along with the code assigned to these Forest Types in the Continuous Inventory of Stand Conditions (CISC) database.

Fire has historically played an important role in shaping the species composition of some forest communities on the Jefferson National Forest. Judicious use of fire is needed to halt the decline of the Table Mountain pine and other southern yellow pine and upland oak forest communities across the Southern Appalachians. Without fire or other vegetation

management actions that approximate fire effects, many communities may decline dramatically in future years and shift towards shade-tolerant and fire-intolerant species. This forest health issue is addressed not only in this section of forest-wide direction, but also in the Rare Community section, Fire Management section, and the Timber Management section. Other aspects of forest health are also addressed in the Watershed and Wildlife sections.

Old Growth

In June 1997, the Region 8 Old Growth Team published *Guidance for Conserving and Restoring Old Growth Forest Communities on National Forests in the Southern Region*. Descriptions of the old growth forest communities found in this report reflect the major community types shown in Table 2-5. Ideal stewardship of old growth communities would allow natural processes to proceed unencumbered, however, in some cases, the prevailing environmental conditions have changed so as to prevent ,or at least hinder, natural processes. Reintroduction of fire and control of non-native diseases, insects, plants, and other competitors require special management strategies. Old growth communities are managed under the 6A, 6B, and 6C Management Prescriptions based on the dependence or association of the forest community to fire. Appendix D contains more detail related to our long-term old growth strategy.

Old growth forests are ecosystems distinguished by old trees and related structural attributes. Old growth encompasses the later stages of stand development that typically

Table 2-5. Relationship between Major Forest Community Types and Forest Types from CISC on the JNF

Community Type	Forest Type	Acres
Northern Hardwood Forest	Sugar maple-Beech-Yellow birch (CISC 81)	16,800
Montane Spruce-Fir Forest	Fraser fir (CISC 6), Red spruce-Fraser fir (CISC 7), Red spruce-Northern hardwood (CISC 17)	4,100
Mixed Mesophytic Forest	Cove hardwood-White pine-Hemlock (CISC 41), Yellow poplar (CISC 50), Yellow poplar-White oak-Red oak (CISC 56), Black walnut (CISC 82).	84,000
Conifer-Northern Hardwood Forest	White pine (CISC 3), White pine-Hemlock (CISC 4), Hemlock (CISC 5), Hemlock-Hardwood (CISC 8), White pine-Cove hardwood (CISC 9), White pine-Upland hardwoods (CISC 10).	21,300
Dry-Mesic Oak Forest	Post oak-Black oak (CISC 51), White oak-Red oak-Hickory (CISC 53), White oak (CISC 54), Northern red oak-Hickory (CISC 55).	269,100
Dry and Dry-Mesic Oak-Pine Forest	Upland hardwoods-Yellow pine (CISC 42), Oaks-Eastern red cedar (CISC 43), Southern red oak-Yellow pine (CISC 44), Chestnut oak-Scarlet oak-Yellow pine (CISC 45), Bottomland hardwoods-Yellow pine (CISC 46), White oak-Black oak-Yellow pine (CISC 47), Northern red oak-Hickory-Yellow pine (CISC 48).	146,700
Dry and Xeric Oak Forest, Woodland, and Savanna	Chestnut oak (CISC 52), Scrub oaks (CISC 57), Scarlet oak (CISC 59), Chestnut oak-Scarlet oak (CISC 60).	120,300
Xeric Pine and Pine-Oak Forest and Woodland	Eastern redcedar-Hardwoods (CISC 11), Shortleaf pine-oaks (CISC 12), Pitch pine-oaks (CISC 15), Virginia pine-oaks (CISC 16), Table Mountain pine-Hardwoods (CISC 20), Longleaf pine (CISC 21), Virginia pine (CISC 33), Pitch pine (CISC 38), Table Mountain pine (CISC 39), Eastern red cedar (CISC 35), Black locust (CISC 88).	41,500
Eastern Riverfront and River Floodplain Hardwood Forests	Sweetgum-Yellow poplar (CISC 58), River birch-Sycamore (CISC 72), Cottonwood (CISC 73), Sugarberry-American elm-Green ash (CISC 63), Beech-Magnolia (CISC 69), Willow (CISC 74), Sycamore-Pecan-American elm (CISC 75).	300

VEGETATION, OLD GROWTH, AND FOREST HEALTH

differ from earlier stages in a variety of characteristics which may include tree size, accumulation of large woody material, number of canopy layers, species composition and ecosystem function. Additional existing old growth patches identified during project-level decision-making and monitoring may be reallocated to Management Prescription 6A, 6B, or 6C if the patch contributes to the desired condition of the management prescription in which it is found or contributes to the forest-wide distribution and abundance of that particular old growth community type.

Forest Health

The high percentage of forest communities aged 80-110 years old pose significant challenges in addressing forest health issues. These large areas of uniformly aged forests are particularly vulnerable to both native and non-native forest pest epidemics. 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 Jefferson 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.

Throughout the past 100 years, a variety of insects, diseases, and plant species have been introduced to the United States and spread into the Jefferson National Forest. These non-native organisms are always considered pests because they often have no natural enemies or other naturally controlling agent and their unchecked spread can wreak untold damage to native ecosystems and forest communities. The chestnut blight has reduced the American chestnut from the predominate tree species on the Jefferson to a minor understory component of today's forests. Other significant non-native pests include the gypsy moth, the hemlock wooly adelgid, beech bark disease, balsam wooly adelgid, butternut canker, and dogwood anthracnose.

The montane spruce-fir forest community is confined to the highest peaks of Virginia, Tennessee, and North Carolina. These communities are threatened across their range by infestations of balsam wooly adelgids. The stresses induced by insect attack are exacerbated by additional stresses of acid precipitation and high recreation pressure. Spruce-fir communities support several rare terrestrial wildlife species including an endangered subspecies of northern flying squirrel and Weller's salamander. Restoration centers on increasing stand structural complexity and enhancing the stocking of red spruce through the release of spruce saplings from the understory of northern hardwoods, planting seedlings in open areas, and promoting natural reforestation of open areas. The Forest will cooperate in efforts to minimize adverse effects of acid precipitation and balsam wooly adelgid on spruce-fir communities and develop cooperative relationships with private landowners to maintain or establish habitat corridors between patches of spruce-fir habitat.

Air pollution

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, nitrate deposition is most important in spruce-fir forests. The sources of acidifying compounds are generally located off national forest 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.

Non-Native Invasive Plants

Non-native invasive plants currently causing problems on the Jefferson National Forest include ailanthus (tree of heaven), kudzu, multiflora rose, and purple loosestrife. Some native plant species, commonly referred to as weeds, can also cause forest health problems. Wild mustard is an example of a native problem weed pest on the Jefferson National Forest. The Forest will contribute, whenever possible, to research aimed at suppression of hemlock wooly adelgid, balsam wooly adelgid, beech bark disease, dogwood anthracnose and other introduced significant non-native invasive pest problems.

Category 1 Species are non-native plant species that are known to be invasive and persistent throughout all or most of their range within the Southern Region. They can spread into and persist in native plant communities and displace native plant species, therefore posing a demonstrable threat to the integrity of the natural plant communities in the Region. Category 2 Species are non-native 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. Plant species in Category 2 pose a significant risk to the integrity of natural plant communities throughout the Region or in parts of the Region. The Forest will strive to minimize negative effects of non-native invasive species and control such species where feasible and necessary to protect national forest resources.

VEGETATION, OLD GROWTH, AND FOREST HEALTH

GOALS AND OBJECTIVES:

GOAL 12 Manage forest ecosystems to maintain or restore composition (mix of species), structure (age class distribution), and function (resulting benefits to the ecosystem and humans) within desired ranges of variability.

OBJECTIVE 12.01 Maintain approximately 21,000 acres of Montane Spruce-Fir and Northern Hardwood Forest communities, sustaining 75% in mid- to late-successional condition and at least 50% in late-successional condition by the end of the planning period. Develop, implement, and test methods for restoring spruce-fir forests to historically occupied areas. (See Management Prescription 4K3 for specific restoration objectives for these communities).

OBJECTIVE 12.02 Restore 1,300 acres of open woodland and grassland complexes within the **Xeric Pine and Pine-Oak Forest and Woodland** community on the Jefferson National Forest over the planning period, including 700 acres of **Table Mountain pine**. Maintain 41,500 acres of Xeric Pine and Pine-Oak Forest and Woodland community, sustaining 10-12% in an early/late successional woodland condition by the end of the planning period.

OBJECTIVE 12.03 Maintain 84,000 acres of **Mixed Mesophytic Forest** communities, sustaining 75% in a mid- to late-successional condition and at least 50% in a late-successional condition by the end of the planning period.

OBJECTIVE 12.04 Establish one American chestnut research and restoration site across the forest in partnership with the American Chestnut Cooperators Foundation and the American Chestnut Foundation over the planning period.

OBJECTIVE 12.05 Maintain existing **Dry-Mesic Oak, Dry and Dry-Mesic Oak-Pine, Dry and Xeric Oak Forest** communities through a combination of timber harvest, prescribed burning, and wildland fire use across 28,000 acres per decade.

GOAL 13 Provide a well-distributed and representative network of large, medium, and small old growth patches managed through restoration, protection, or maintenance activities to provide biological and social benefits. (Refer to Appendix D, Old Growth Strategy).

OBJECTIVE 13.01 Provide the following acres of each community type in an old growth or late-successional condition by the end of the decade:

Community Type	Acres	Community Type	Acres
Northern Hardwood	8,400	Dry and Xeric Oak	12,000
Conifer-Northern Hardwood	2,200	Xeric Pine and Pine-Oak	3,400
Dry and Dry-Mesic Oak-Pine	14,700	Mixed Mesophytic	8,500
Riverfront and Floodplain Hardwood	150	Montane Spruce-fir	2,100
Dry-Mesic Oak	27,000		

GOAL 14 Contribute to maintenance or restoration of native tree species whose role in forest ecosystems is threatened by insects and disease. Management activities will reduce the impacts from non-native invasive species.

OBJECTIVE 14.01 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.

OBJECTIVE 14.02 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;
- Where legally required due to 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.

VEGETATION, OLD GROWTH, AND FOREST HEALTH

STANDARDS

Vegetation

FW-70: 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-71: When regenerating forest stands, regenerate to native tree species that commonly occur naturally on similar sites within that land type association.

FW-72: To the extent practical, control threats from insects and disease in montane spruce-fir forests.

FW-73: Design all silvicultural treatments in montane spruce-fir forests to maintain or restore the forest type. Silvicultural treatments will not be used for the purpose of creating early successional habitat or for conversion to other forest types.

FW-74: During silvicultural treatments in all forest types, patches of live Eastern hemlock greater than ¼ acre are retained.

FW-75: 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-76: 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-77: Inventory stands for existing old growth conditions during project planning using the criteria in Appendix D. Consider 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. For purposes of project planning, the following forest types are considered well-represented in the current inventory of existing old growth for the Jefferson National Forest: Dry and Xeric Oak Forest Woodland and Savanna; Dry and Dry-Mesic Oak-Pine Forest, and may by cut through resource management activities.

FW-78: Following project analysis, make appropriate adjustments to Management Prescription 6A, 6B, or 6C, depending on community type, through the Forest Plan amendment process.

Gypsy Moth

FW-79: Integrated Pest Management is used to protect resources from damage caused by the gypsy moth.

FW-80: Slow the Spread actions are allowed to slow the gypsy moth's rate of spread from the areas where it is established.

FW-81: 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 *Gypchek*.

FW-82: Eradication actions are allowed to eliminate isolated infestations of gypsy moth that are newly detected.

FW-83: The development, improvement, or experimental testing of natural enemies to both high population treatment tactics (insecticide application) and low population treatment tactics (mating disruption, sterile insect release fungal application, insecticide application, and mass trapping) may be considered in all forest areas except Wilderness, areas under study for possible wilderness inclusion and where indicated in specific management prescriptions.

Southern pine beetle

FW-84: Integrated Pest Management is used to prevent or control damage caused by the southern pine beetle.

FW-85: Use hazard rating models and silvicultural treatments to reduce risk of southern pine beetle infestation in pine forests.

Non-native Invasive Plant Species

FW-86: The use of Category 1 Species is prohibited.

FW-87: The establishment or encouragement of Category 2 Species 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-88: 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.

Pesticides

FW-89: 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-90: Insecticides known to have negative impacts on aquatic ecosystems are not aerially applied within 200 feet, nor ground applied within 30 horizontal feet of perennial streams, wetlands, or open bodies of water.

FW-91: 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 area 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.

VEGETATION, OLD GROWTH, AND FOREST HEALTH

FW-92: Treatment of developed recreation areas such as picnic areas and campgrounds or dispersed areas of high concentrated use are 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-93: 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-94: 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.

Table 2-6. Classification of chemical/method combinations when used at typical rates and exposures

Application Method	Class				
	A		B	C	D
Manual ground:					
Cut surface	Dicamba Glyphosate Imazpyr	Picloram Triclopyr Amine	2, 4-D Amine		
Basal stem	Diesel Kerosene Limonene	Triclopyr Ester 2, 4-DP	2, 4-D Ester		
Soil Spot	Hexazionone				
Foliar Spray	Fosamine Glyphosate Hexazionone Imazpyr Kerosene	Limonene Picloram Sulfometuron Methyl Triclopyr Amine Triclopyr Ester	2, 4-D Amine 2, 4-D Ester 2, 4-DP	Tebuthiuron	
Mechanical ground	Diesel Dicamba Fosamine Glyphosate Hexazionone Imazpyr	Picloram Sulfometuron Methyl Triclopyr Amine Triclopyr Ester 2, 4-DP	2, 4-D Amine 2, 4-D Ester Tebuthiuron		
Aerial	Diesel Fosamine Glyphosate Hexazionone Imazpyr Kerosene	Limonene Picloram Sulfometuron Methyl Triclopyr Amine Triclopyr Ester 2, 4-DP	2, 4-D Amine 2, 4-D Ester Tebuthiuron		

VEGETATION, OLD GROWTH, AND FOREST HEALTH

FW-95: Herbicides and application methods are chosen to minimize risk to human and wildlife health and the environment. No class B, C, or D chemical (See Table 2-6) may be used on any project without the approval of the Regional Forester. Vegetable oil is used as the herbicide carrier when available and compatible with the proposed application.

FW-96: Areas do not undergo prescribed burning for at least 30 days after herbicide treatment.

FW-97: 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-98: 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-99: 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-100: 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-101: 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-102: No soil-active herbicide is applied within 30 feet of the drip line of reserved vegetation (e.g. den trees of hardwood inclusions) or within 30 feet of the drip line of vegetation adjacent to the treated area.

FW-103: Aquifers and public water sources are identified and protected.

FW-104: 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-105: 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-106: No herbicide is broadcast on rock outcrops or sinkholes. No soil-active herbicide with a half-life longer than 3 months is broadcast on slopes over 45%, erodible soils, or aquifer recharge zones. Such areas are clearly marked before treatment so applicators can easily see and avoid them.

VEGETATION, OLD GROWTH, AND FOREST HEALTH

TIMBER MANAGEMENT

Table 2-7. Unacceptable Weather Conditions For Herbicide Application

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

FW-107: Weather is monitored and the project is suspended if temperature, humidity, or wind becomes unfavorable as shown in Table 2-7.

FW-108: Nozzles that produce large droplets (mean droplet size of 50 microns or larger) of 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.

Salvage

FW-109: 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-110: There are no dispersion requirements for salvage treatment areas.

TIMBER MANAGEMENT

The management philosophy of the timber management program on lands identified as suitable for timber production includes a planned periodic harvest applying biological and scientific principles to influence tree-species composition, control stocking, ensure adequate reforestation, facilitate harvesting of trees and protect the productivity of the site while providing for a healthy vigorous forest within the growth capabilities of the sites.

Trees and the products derived from them are a highly valued forest resource, carefully managed in a cost-effective manner through a coordinated timber program where multiple-use objectives are realized. Forest product outputs contribute to the social and economic well-being of the people living in the area. Forest products vary from high quality veneer for furniture and flooring to small diameter pulp logs used in the production of paper.

Because this Forest Plan is focused on achieving ecological, biological, and aesthetic desired conditions, lands suitable for timber production are focused on those areas where a sustainable timber harvest program is a cost-efficient method of achieving these desired conditions and multiple-use objectives. For instance, to maintain a mix of successional habitats or a desired species composition, lands suitable for timber production are distributed fairly evenly between sites capable of producing high quality sawtimber and those sites not capable of producing high quality sawtimber. This distribution will provide a mix of forest products to supply local markets. The result is a timber sale program where some timber sales may have costs that exceed revenues.

The estimated demand for timber products from the Forest is 68 million board feet for the first decade of the planning period. This Plan contains an allowable sale quantity of 21 million board feet per year for the first decade. This includes 10 million board feet of high

quality sawtimber and 11 million of low quality sawtimber and pulpwood. Although less than the anticipated demand, this allowable sale quantity is designed primarily to achieve the desired conditions described in the following management prescriptions: 4E1b, 4K1, 4J, 7B, 7C, 7E2, 7F, 8A1, 8B, 8C, 8E1, 8E2b, 8E4b, 8E6, 9A1, 9A3, 9H, and 10B. An additional 1 million board feet is estimated from lands not suitable for timber production, however, since achievement of these desired conditions and objectives is not dependent upon a regular harvest, the volume produced will fluctuate widely.

This Forest Plan identifies 258,900 acres as suitable for timber production. Lands suitable for timber production are shown on a map that accompanies this Plan. Table 2-8 contains a breakdown of the suitability of lands for timber production by management prescription. Appendix F contains a discussion on the determination and location of lands suitable for timber production.

The allowable sale quantity normally includes timber volume from scheduled timber sales on lands suitable for timber production. When salvage cutting occurs on these suitable lands, the salvage volume replaces scheduled timber sale volume and is considered part of the allowable sale quantity. Salvage cutting on lands unsuitable for timber production is

Table 2-8. Acres Suitable for Timber Production

Management Prescription	Total Acres	Suitable Acres	Management Prescription	Total Acres	Suitable Acres
0B	3,500	0	7D	6,000	0
1A	57,800	0	7E1	19,600	0
1B	25,200	0	7E2	51,800	36,200
2C1	900	0	7F	3,900	1,300
2C3	4,400	0	7G	3,700	0
4A	30,700	0	8A1	112,600	85,600
4C1	1,500	0	8B	19,600	13,200
4D	4,700	0	8C	57,300	40,600
4E1a	200	0	8E1	16,000	11,500
4E1b	1,500	1,000	8E2a	2,400	0
4F	1,000	0	8E2b	5,300	4,100
4J	3,900	1,900	8E4a	900	0
4K1	5,200	1,500	8E4b	8,800	6,400
4K2	4,400	0	8E6	1,300	400
4K3	5,100	0	9A1	19,200	12,800
4K4	5,100	0	9A2	<100	
4K5	4,200	0	9A3	1,700	500
4K6	5,500	0	9A4	6,500	0
5A	200	0	9F	7,400	0
5B	200	0	9G1	100	0
5C	3,700	0	9H	24,700	12,900
6A	300	0	10B	16,200	11,600
6B	800	0	11	(73,600)	0
6C	30,200	0	12A	9,700	0
7A	1,800	0	12B	91,300	0
7B	23,500	17,000	12C	9,800	0
7C	1,500	400	TOTAL	723,300	258,900

Since riparian corridors are not mapped, the 73,600 acres in Management Prescription 11 is an estimate. These acres are not subtracted from all of the other prescriptions. There are roughly 723,300 acres on the Jefferson National Forest.

TIMBER MANAGEMENT

Table 2-9. Relationship between Forest Community Types and Timber Management Working Groups

Working Group	Forest Communities
Cove Hardwoods	Northern Hardwood Forest, Mixed Mesophytic Forest, Eastern Riverfront and River Floodplain Hardwood Forests
Upland Hardwoods	Dry-Mesic Oak Forest, Dry and Dry-Mesic Oak-Pine Forests, and a portion of the Dry and Xeric Oak Forest
White Pine	Conifer-Northern Hardwood Forest
Yellow Pine	Xeric Pine and Pine-Oak Forest Woodlands
Scarlet Oak/Black Oak	A portion of the Dry and Xeric Oak Forest

not part of the allowable sale quantity. The allowable sale quantity plus volume produced on unsuitable lands through achievement of desired conditions or salvage comprise the total "Timber Sale Program" listed in Objective 15.01.

Management of the Jefferson National Forest balances the ecological value of leaving dead, dying, and damaged trees as a natural part of the ecosystem with aesthetic desires and economic values of this resource that can be used for fuelwood or sawtimber if removed prior to deterioration. Only a relatively small percent of the mortality across the Forest is removed through salvage cutting operations with the remainder providing organic matter, nutrients, tree cavities, large woody debris, etc. Those dead, dying, and damaged trees that are removed protect the safety of forest visitors, enhance scenery, and provide valuable wood products including fuelwood.

Analysis and standards related to timber management combine the forest communities discussed under the Vegetation and Forest Health Section into working groups. The forest communities are aggregated as shown in Table 2-9.

Appropriate regeneration methods are used that will perpetuate desirable tree species. Regeneration cutting will be done in a variety of methods depending upon the site, species composition, management objectives, scenic guidelines, and wildlife objectives. Decisions on specific regeneration harvest methods are based on site-specific project-level analysis.

GOALS AND OBJECTIVES:

GOAL 15 Where forest management activities are needed and appropriate to achieve the desired composition, structure, function, productivity, and sustainability of forest ecosystems; a result of such activities will also be to provide a stable supply of wood products for local needs.

OBJECTIVE 15.01 Provide a total Timber Sale Program of 4.0 million cubic feet (MMCF) [22 million board feet (MMBF)] annually.

GOAL 16 Provide supplies of those wood products where the Forest Service is in a unique position to make an impact on meeting the demand for those products.

OBJECTIVE 16.01 Provide 8-12 MMBF sawtimber product annually on sites with a site index of 70 or better when compatible with desired condition of the appropriate management prescription.

OBJECTIVE 16.02 Provide 2400 hundred cubic feet (CCF) of fuelwood available for personal use annually.

STANDARDS

Harvesting Methods

FW-111: Use advanced harvesting methods on sustained slopes 45 percent or greater to avoid adverse impacts to the soil and water resources. Use advanced harvest systems on sustained slopes over 20 percent when soils have a high erosion hazard or are failure-prone.

Rotations

FW-112: Rotations are specified under the management prescriptions that are suitable for timber production.

FW-113: 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.

Even-aged and Two-aged Management

FW-114: The maximum size of an opening created by even-aged or two-aged regeneration cutting is 40 acres in Virginia and 25 acres in West Virginia. 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-115: 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-116: Even-aged or two-aged regeneration cutting may be scheduled next to uneven-aged stands at any time.

Regeneration Harvests

FW-117: 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 in Table 2-10. 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.

TIMBER MANAGEMENT

Table 2-10. Restocking Standards

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]These levels are guides and must be used in conjunction with professional judgment to determine acceptable restocking levels for a specific site.

FW-118: No heavy equipment is used for site preparation on sustained slopes over 35 percent or sustained slopes over 20 percent when soils have a high erosion hazard or are failure-prone.

Uneven-aged Management

FW-119: 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-120: Uneven-aged regeneration methods are allowed on lands other than listed in FW-119 when site-specific project objectives include canopy gap creation, scenic enhancement, or restoration/enhancement of old growth forest conditions.

FW-121: There are no dispersion requirements for openings created by uneven-aged regeneration methods. Cutting cycles will vary from 5-20 years depending upon management objectives.

FW-122: The maximum size limit of group selection openings is 2 acres.

Non-Timber Forest Products

FW-123: 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 Forest-wide from existing roads, except where prohibited by management prescription direction.

FW-124: Collection of botanical products is subject to the following restrictions:

- Commercial moss collection 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 (seed collection, cuttings, etc.) are allowed for all species, except Fraser fir.
- Prohibit collection of Fraser fir seedlings, seeds and cones.

Log Landings and Skid Trails

FW-125: Log landings will be located outside of riparian corridors.

FW-126: All equipment used for harvesting and hauling operations will be serviced outside of riparian corridors.

FW-127: Ruts will be smoothed to restore hydrology and drainage paths.

FW-128: 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-129: 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. Restoration of skid trails will occur as soon as possible to mitigate impacts.

FW-130: When removing felled trees from areas of hydric soils, use methods that avoid rutting or displacing soil (i.e., use of low ground pressure skidders).

FW-131: Skidding of trees should be directed in a manner that prevents creation of channels or gullies that concentrate water flow to adjacent streams.

FW-132: Temporary stream crossings will be removed and rehabilitated.

FW-133: 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.

FIRE MANAGEMENT

The presence of fire on the Jefferson National Forest began long before humans arrived in North America. Evidence of lightning fires exists in coal layers and as lightning scars on petrified trees. Sedimentary records are one method of constructing fire histories in the east for pre-European settlement times. These studies typically extract a core of sediment from a pond or bog, and that core is then sampled for fossil pollen, plant macrofossils, sponge spicules, and/ or charcoal.

Studies by Elaine Sutherland and others on Brush Mountain on the New River Valley Ranger District, sought to "reconstruct the historical relationship between fire and community structure using both the age and species composition approach in combination with tree-ring fire history analysis." The fire scar chronology indicated that fire occurred frequently (every 9-11 years) throughout the 19th century and early 20th century. Most of those fires occurred during the dormant season, most likely in early spring. Hot fires may have occurred during the growing season. They stated that "Fire suppression is most likely the cause of a dramatic change in the composition of the Brush Mountain communities during the last 60 years. In the past, fire clearly promoted integrity of the *Pinus pungens* community on Brush Mountain."

Even today, lightning and thunderstorms are abundant, and Stephen Pyne in *Fire in America: A Cultural History of Wildland and Rural Fire*, surmised that "a phenomenon of such magnitude and longevity has unquestionably kindled profound evolutionary consequences."

A clearer picture of change over time is gained when we focus on the period since the last ice age. Dramatic change in plant and animal communities occurred during this post-glacial period. Importantly, humans made their way into Virginia as glaciers receded into Canada. Early human occupation of Virginia dates back to approximately 11,500 BP

FIRE MANAGEMENT

(Before Present) during the Paleoindian period. European contact was relatively early in the region of the Jefferson National Forest, and the written historical record of fire is rich with accounts from travelers and explorers. Early observations describe vast areas of grassy savannas, commonplace smoke and fire, clearings and fields and apparent utilization of fire-managed vegetation. From all accounts, regardless of their perspective, burning by Native Americans was a commonplace practice, serving many needs.

The ecosystems we know today developed within the influence of both climatic and human forces. The result is a forest with diversity and flexibility that is well-adapted to fire occurrence. Oak and southern yellow pine communities have been major components of these forests for thousands of years. These communities promote and require fire. Burning is the oldest sustained land management force on these forests. No other practice can be said to have such a track record with known results. At the other end of the spectrum are the rich mesic cove forests, especially those of the Blue Ridge and Cumberlands where conditions are much wetter and rainfalls are higher. Fire plays little if any role in the mixed mesophytic forest communities found in these coves. They follow more of a gap-phase dynamic pattern and stand structure is frequently uneven aged. Every forest community type has a different mix of disturbance agents operating at different frequencies and intensities depending on current and past climatic conditions.

Air Quality

The Environmental Protection Agency (EPA) states, in their 1998 policy document entitled *Interim Air Quality Policy on Wildland and Prescribed Fires*, that while future air quality concerns from prescribed fire may arise, the EPA is on record stating that fire should function, as nearly as possible, in its natural role in maintaining healthy wildland ecosystems and human health and welfare should be protected by mitigating the impacts of air pollutant emissions on air quality and visibility.

During the period covered by the 1985 Jefferson Plan, EPA tightened the National Ambient Air Quality Standards (NAAQS) for particulate matter (PM) and ozone. For PM they added a new standard (PM2.5) that focuses on the group of very small particles which have a diameter of 2.5 microns or less. For ozone, they revised the statistic that must be met for NAAQS attainment. Both revisions involve pollutants that are emitted from national forest management activities, especially prescribed fire. Virginia air quality monitoring data (2000 – 2002) indicate that at least one county with national forest land inside, or near, its boundary may fall out of NAAQS attainment during the time frame of the revised Plan, as a result of these revisions. If any counties near the national forest are classified by the State as "nonattainment" for NAAQS, national forest managers will then need to work with State air quality regulators to develop emissions inventories and other information. National forest emission inventories will be incorporated with other air pollution inventories as the State Implementation Plan is modified to restore NAAQS attainment.

Wildland Fire Use & Suppression

The role of wildland fire as an essential ecological process has been incorporated into this Forest Plan. Wildland Fire Use will become an option for the management of natural (lightning-caused) fires in Management Prescriptions identified as suitable for Wildland Fire Use when we have completed a Fire Management Plan for the Forest. The Fire Management Plan uses information about fire regimes, current conditions, land management objectives, and monitoring to provide for a full range of management actions and maintains a close link between this Forest Plan and our fire program. When a wildland fire ignites in an area identified as suitable for wildland fire use within the parameters established in the Fire Management Plan, a decision is made whether the fire will be suppressed or managed for resource benefits. The Wildland Fire Implementation Plan documents the thought process involved in this decision.

Appropriate suppression strategies include 1) direct attack to minimize acreage burned and resource value loss; 2) indirect attack when fire behavior is too extreme to safely use direct suppression tactics; and 3) monitoring of a fire's progress within a defined perimeter. Appropriate suppression strategies take into account resource values, economic expenditures, and critical firefighting resource priorities, while always providing for firefighter and public safety as the highest consideration. Wildland fire suppression does not consider or attempt to achieve resource objectives.

Prescribed Fire and Mechanical Fuels Treatments

Prescribed fire and mechanical fuels treatments are designed to restore fire regimes within or near an historical range. Condition classes are a function of the degree of departure from historical fire regimes resulting in alterations of key ecosystem components such as species composition, stand structure, successional stage, stand age, and canopy closure. Fire Condition Class is a measure of general wildland fire risk and ecosystem condition defined as follows:

Condition Class 1: For the most part, fire regimes in this Fire Condition Class are within historical ranges. Vegetation composition and structure are intact. Fire dependent ecosystem components are maintained by desired fire regimes. Thus, the risk of losing key ecosystem components from the occurrence of wildland fire remains relatively low.

Condition Class 2: Fire regimes on these lands have been moderately altered from their historical range by either increased or decreased fire frequency. A moderate risk of losing key ecosystem components has been identified on these lands.

Condition Class 3: 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 components have been significantly altered. Consequently, these lands verge on the greatest risk of ecological collapse.

GOALS AND OBJECTIVES:

GOAL 17 Achieve a balance between suppression to protect life, property, and resources, and fire use to regulate fuels and maintain healthy ecosystems. Use wildland fire to protect, maintain, and enhance resources, and, as nearly as possible, allow it to function in its natural ecological role.

GOAL 18 Fire regimes are restored within or near the historical range (Condition Class 1) resulting in maintenance and restoration of ecosystem components.

OBJECTIVE 18.01 Maintain a prescribed burn cycle of 3-8 years in fire-maintained forest and grassland communities containing threatened, endangered, sensitive, and locally rare species. (For example: piratebush, box huckleberry, smooth green snake, and sword-leaf phlox).

FIRE MANAGEMENT

OBJECTIVE 18.02 Maintain a prescribed burn cycle of 4-12 years in **Dry and Xeric Oak Forest, Woodlands, and Savannas** and in **Xeric Pine and Pine-Oak Forest and Woodland** communities.

OBJECTIVE 18.03 Maintain a prescribed burn cycle of 8-20 years in **Dry-Mesic Oak Forest**, and **Dry and Dry-Mesic Oak-Pine Forest** communities.

OBJECTIVE 18.04 Reduce hazardous fuels across 4200 acres per year with priority given to areas where fire regimes have been moderately (Condition Class 2) or significantly (Condition Class 3) altered from their historic range; and areas affected by insects, diseases, ice damage, or along National Forest boundaries with high values at risk.

GOAL 19 Emissions from prescribed fire will not hinder the state's progress toward attaining air quality standards and visibility goals.

OBJECTIVE 19.01 Demonstrate conformity with the State Implementation Plan for any prescribed fire planned within EPA-designated "non-attainment" and "maintenance" areas.

STANDARDS

Wildland Fire Suppression

FW-134: 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-135: Suppress human-caused wildland fires (either accidental or arson).

FW-136: The full range of suppression tactics (from full suppression to monitoring) may be used, consistent with forest and management prescription direction.

FW-137: Suppress wildland fires at minimum cost, considering firefighter and public safety, benefits, and values to be protected, consistent with resource objectives.

FW-138: Where needed to prevent erosion, firelines are revegetated and water-barred promptly after the fire is controlled.

Wildland Fire Use

FW-139: The management of lightning caused wildland fires is allowed when the Fire Management Plan is completed and a Wildland Fire Implementation Plan is approved for the specific wildland fire.

FW-140: 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-141: 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-142: 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-143: Conduct prescribed burning only if meterological conditions ensure that smoke will be carried away from areas with a high forecasted Air Quality Index (Orange or higher).

FW-144: 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-145: 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 present.

FW-146: Do not conduct prescribed fires when the Keetch-Byram Drought Code (Cumulative Severity Index) is 200 points above the average for the relevant time of the year.

FW-147: 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, avoid burning these communities when implementing prescribed fires in adjacent forest communities.

FW-148: 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-149: Maintain and restore Table Mountain pine and pitch pine forests through moderate to high intensity prescribed fires.

Other Fuels Treatment

FW-150: 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. Mechanical fuels treatments are prohibited on sustained slopes over 20 percent when soils have a high erosion hazard or are failure-prone.

RECREATION

RECREATION - DEVELOPED, DISPERSED, AND BACKCOUNTRY

The Jefferson National Forest, along with the George Washington National Forest, provide the majority of undeveloped public land in Virginia and will become increasingly important in a region experiencing major population growth. The Forest provides spectacular upland scenery, unique ecosystems, trails, and related recreation opportunities. Interstates, the Blue Ridge Parkway, and 1,125 miles of trail systems, including the Appalachian National Scenic Trail, facilitate easy access. The proximity of large urban areas in northern Virginia, the Richmond-Tidewater, and North Carolina Triad-Research Triangle-Charlotte metro areas promotes high volume urban escapes, and the more rural lands are the backyard playgrounds and tourism attractions for many smaller communities.

The rugged mountain landscape makes premier sightseeing and trails the focus of the Forest. Seasonal flora, waterfalls, streams, and lakes, wildlife, and pristine scenery set the stage for a wide variety of recreation experiences. The Forest provides trail experiences for varied interests and skill levels. The Appalachian Trail offers quality day hiking and long distance backpacking. Most trails on the Forest are designed for multiple uses: foot, bike, and horse. The Mount Rogers high country attracts visitors from outside the region, providing a unique horseback riding experience and spectacular views. Mountain biking continues to grow in popularity with some trails, like the Virginia Creeper, also drawing recreationists from far outside our region. Limited public land available for Off-Highway Vehicle and All-Terrain Vehicle use in the region positions the Forest to serve this interest in a carefully planned and environmentally responsible manner.

Lakes, streams, upland forests, and historic sites provide the attraction for day and overnight camping visits by urban recreationists. The more rural parts of the Forest are well-suited for nearby residents to enjoy hunting, fishing, camping, and other dispersed recreation experiences. There are many opportunities for visitors to learn about natural and cultural resources and how to recreate responsibly.

Although the opportunities for outdoor recreation are extensive and the public demand for these opportunities is seemingly endless, the Forest's capability to meet these demands is neither static nor endless. Visitor preferences can shift over time, and both changing financial limitations and environmental impacts must be considered. In order to maximize value to the public with the limited resources available, the forest will focus on providing those recreation opportunities, which are unique, or of exception long-term value, in a manner that focuses on maximizing visitor satisfaction within financial and environmental limitations.

GOALS AND OBJECTIVES:

GOAL 20 Provide a spectrum of high quality, nature-based outdoor recreation experiences that reflect the exceptional resources of the Forest and interests of the recreating public in an environmentally sound and financially sustainable basis. Adapt management of recreation facilities and opportunities as needed to shift limited resources to those opportunities.

OBJECTIVE 20.01 Maintain 117,000 acres of Semi-Primitive Non-Motorized (SPNM), 20,700 acres of Semi-Primitive Motorized (SPM), and 98,800 acres of Semi-Primitive 2 (SP2) backcountry recreation opportunities.

OBJECTIVE 20.02 Increase the following recreation opportunities within the capabilities of the land:

- Wildlife and bird viewing, photography, interpretive opportunities, and nature trails;
- Day use and group facilities;
- Water-based activities;
- Hiking, biking, and equestrian trail systems, especially in non-motorized settings with high quality landscapes;
- Designated Off-Highway Vehicle roads for full size off road vehicles;
- Special Interest Areas - historical, geologic, and prehistoric.

OBJECTIVE 20.03 Maintain approximately 1,125 miles of non-motorized trails and approximately 60 miles of motorized trails.

OBJECTIVE 20.04 Evaluate one new All-Terrain Vehicle area on the southern end of the I-81 corridor and one on the Clinch Ranger District.

STANDARDS

Developed Recreation

FW-151: Manage developed recreation areas according to Management Prescription 7D.

Dispersed Recreation

FW-152: Disabled hunter access is provided on roads and trails specifically designated for such use.

Backcountry Recreation

FW-153: Manage backcountry recreation areas according to Management Prescriptions 12A, 12B, 12C, or 8C.

Trails

FW-154: The Appalachian Trail standards are addressed in the standards for Management Prescription 4A.

FW-155: Trails are closed to motorized recreation use unless designated otherwise.

FW-156: 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-157: Any new trail construction or reconstruction is carefully located to avoid impacts to threatened, endangered, sensitive, or locally rare species habitat.

FW-158: 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

RECREATION

trail closure, avoidance and reclamation; and timing of project implementation to reduce impacts during high use periods.

FW-159: 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.

Recreation Opportunity Spectrum

FW-160: The Recreation Opportunity Spectrum (ROS) inventory completed for this Forest Plan is displayed on a Map accompanying this Forest Plan. The Standards in this section and under each Management Prescription in Chapter 3 refer to this inventory.

FW-161: New structures and facilities are constructed and maintained to meet the adopted ROS class for the area.

FW-162: Recreation opportunity maps will govern all new projects, including special uses. Existing conditions may not meet the assigned ROS classes.

Exceptions to the following six standards are made for fire management and valid existing rights and leases.

FW-163: Prohibit new road construction, including temporary roads, in **semi-primitive non-motorized** areas. These areas do not contain any improved roads. Motorized recreational uses are prohibited within semi-primitive non-motorized areas. Administrative motorized uses, such as those associated with fire suppression, prescribed burning, maintenance of wildlife openings, or forest health needs are allowed.

FW-164: Prohibit new permanent road construction within **semi-primitive motorized** areas. Road restoration and maintenance is 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 areas is allowed provided such roads are obliterated following the temporary use.

FW-165: Maintain existing unimproved 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.

FW-166: **Semi-primitive 2** areas are designated under this Forest Plan to prevent loss of semi-primitive non-motorized and semi-primitive motorized recreation opportunities. Management activities and uses, including-but not limited to—timber harvest, prescribed burning, livestock grazing, off-highway vehicle use, mineral leasing, and special use authorizations, are allowed provided such use will not result in a loss of semi-primitive non-motorized or semi-primitive motorized recreation opportunities.

FW-167: Prohibit new permanent road construction within **semi-primitive 2** areas. Road restoration and maintenance is allowed provided an unimproved or temporary road is not converted to an improved or permanent road. Allow temporary road construction in semi-primitive 2 areas, provided such roads are obliterated following the temporary use.

FW-168: Maintain existing improved roads within **semi-primitive 2** areas when necessary to achieve the desired condition of the appropriate management prescription. Decommission unneeded roads in these areas.

Off-Highway Vehicles (OHVs)

FW-169: Designated routes for full size off road vehicles and use areas for ATVs are managed under Management Prescription 7C.

FW-170: OHV use on open public roads is limited to licensed vehicles and operators that comply with motor vehicle laws of the state.

FW-171: Full size off road vehicles are permitted on Forest Service roads open to the public. These vehicles must be street legal and properly licensed. Trail use is not permitted.

FW-172: ATV's are restricted to routes (roads and trails) specifically designated as open to such vehicles.

FW-173: 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-174: Consideration of new ATV Use Areas begins with a screening process. Demand for new routes and use areas is determined and documented. In measuring demand, the following factors are normally included: the commitment of a club for assistance with construction, maintenance, patrolling and monitoring; significant number of requests by users or other citizens to provide facilities; demonstrated conflicts with other Forest users; and existing uncontrolled use.

FW-175: OHV 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. Routes that provide access for disabled visitors or seasonal hunters may be exceptions.

FW-176: Candidate roads and trails are eliminated or mitigating measures are planned where soil and water quality cannot be maintained within acceptable standards.

FW-177: OHV routes are selected that avoid sensitive areas including, but are not limited to, threatened, endangered, and sensitive species habitat, rare communities, and native brook trout streams.

FW-178: Following evaluation, new routes and use areas are incorporated into Management Prescription 7C. In the case of a new ATV Use Area, this will be done through a forest plan amendment.

FW-179: New routes and use areas can only be considered in Management Prescriptions designated as suitable for such uses.

Types of OHVs

All-Terrain Vehicles (ATVs): Unlicensed, three- or four-wheeled vehicles, 50 inches wide or less.

Motorcycles: Licensed or unlicensed.

Full size off road vehicles: Licensed, over 50 inches wide, like Jeeps, with high clearance for traveling over rough terrain.

See also the Glossary in Appendix B.

WILDERNESS AND WILD & SCENIC RIVERS

The Jefferson National Forest contains 11 wildernesses, totaling 57,645 acres. A list of these wildernesses and their respective acreages is shown in Table 2-11. Small portions of the Shawvers Run and Barbour's Creek Wildernesses are located on the George Washington National Forest. These include 95 acres of the Shawvers Run Wilderness and 20 acres of the Barbour's Creek Wilderness. Each of the wildernesses has an implementation document and a Wilderness Implementation Schedule, which outlines direction for management of the wilderness. The Limits of Acceptable Change Process is used to update the plans and schedules for each wilderness as needed. Lewis Fork, Little Wilson Creek, and Mountain Lake Wildernesses receive moderate to high levels of visitor use. James River Face, Peters Mountain and Thunder Ridge Wildernesses receive a moderate amount of use while the remaining units receive a low level of visitation. In

WILDERNESS AND WILD & SCENIC RIVERS

Table 2-11. Congressionally Designated Wilderness Areas

Wilderness Area	Acres	Wilderness Area	Acres
James River Face	8,886	Kimberling Creek	5,542
Thunder Ridge	2,344	Beartown	5,609
Barbour Creek*	5,382	Little Dry Run	2,858
Shawvers Run*	3,467	Lewis Fork	5,618
Mountain Lake	11,113	Little Wilson	3,613
Peters Mountain	3,328		

* Includes 20 acres of Barbours Creek and 95 acres of Shawvers Run on the George Washington National Forest.

general, the level of use can be correlated to the occurrence of key attractions and trails like the Mount Rogers High Country and the Appalachian Trail. The impacts of human recreation use and illegal motorized use are the major management concerns.

James River Face Wilderness is designated a Class I area under the Clean Air Act Amendments of 1977. Air Quality Related Values (AQRV) for this Class I area are visibility, water quality and vegetation. The AQRVs are suffering adverse effects from current and historic levels of air pollution. Sulfur compounds in the atmosphere are primarily responsible for the haze that reduces visibility. Sulfur compounds, and sometimes nitrogen compounds, cause acidification of headwater streams, and can cause nutrients to leach out of soils. Ozone causes visible injury to plant leaves, and can also reduce plant growth. The pollutants originate from many sources over a wide geographic area, and

Table 2-12. Eligible Recreational Rivers

River	Ranger District	Length (miles)	Counties	NFS Ownership (left bank)[1]	NFS Ownership (right bank)	Outstandingly Remarkable Values	Responsibility for Suitability Analysis
Little Stony	New River Valley	3.2	Giles	3.2	2.8	Scenic, Recreation, Geologic	Forest Service
Stony Creek	New River Valley	8.3	Giles	7	6	Fisheries/ Aquatic[2]	Forest Service
Clinch River	Clinch	5.5	Scott	0.4	0	Heritage/Cultural, Botanic/Ecologic, Geologic	Commonwealth of Virginia
Guest River	Clinch	6.5	Wise, Scott	3.5	1.7	Scenic, Geologic, Recreation, Heritage/Cultural, Botanic/Ecologic	Commonwealth of Virginia
Little Stony	Clinch	8.5	Scott	8.5	8.5	Scenic, Wildlife, Botanic/Ecologic, Geologic	Forest Service
Russell Fork	Clinch	8.7	Dickenson	0	4.4	Scenic, Wildlife, Recreation, Heritage/Cultural, Botanic/Ecologic, Geologic	Commonwealth of Virginia
James River	Glenwood	23	Botetourt, Rockbridge	10	0	Scenic, Recreation, Heritage/Cultural, Biologic/Ecologic, Geologic	Commonwealth of Virginia
North Creek	Glenwood	7	Botetourt	7	7	Scenic, Recreation	Forest Service
Whitetop Laurel/ Green Cove	Mount Rogers NRA	12	Washington	10.5	10	Scenic, Recreation, Geologic	Forest Service

[1] Left and Right banks are looking upstream.

[2] Highlighted Outstandingly Remarkable Values are Nationally Significant. Others are Regionally Significant.

therefore regional approaches to air pollution emission reductions are necessary to improve air quality and resource conditions. It is essential that the Forest work cooperatively with air management agencies and regional planning organizations to improve visibility conditions (Regional Haze Regulation, EPA 1999) and reduce air pollution impacts to other AQRVs at James River Face.

Three miles of Roaring Branch on the Clinch Ranger District were identified as eligible to be considered for designation as part of the National Wild and Scenic Rivers System under the "Wild" classification. Roaring Branch is managed under Management Prescription 2C1. The rivers shown in Table 2-12 were found to be eligible for consideration as potential Wild and Scenic Rivers with a Recreational Classification. Little Stony on the New River Valley Ranger District, the Clinch River, the Guest River, and Little Stony on the Clinch Ranger District are managed under Management Prescription 2C3.

Stony Creek is managed under management prescription 9A4 (Aquatic Habitat Areas). National Forest System lands make up a very small proportion of Russell Fork and the James River. Russell Fork is managed under the adjacent management prescription 4C (Special Geologic Area). The James River is managed under management prescriptions 9G (Bottomland Hardwoods), 7E2 (Dispersed Recreation), and 9F (Rare Communities). North Creek and Whitetop Laurel/Green Cove both lie within 4K (Special Areas).

The outstandingly remarkable values of all eligible rivers will be protected regardless of their management prescription allocation.

GOALS AND OBJECTIVES:

GOAL 21 Wilderness, roadless and other backcountry areas are managed to provide their full range of social and ecological benefits.

OBJECTIVE 21.01 Maintain wilderness character within wilderness (Management Prescription 1A) and wilderness study areas (Management Prescription 1B).

OBJECTIVE 21.02 Maintain 152,900 acres of roadless in a natural unroaded condition.

OBJECTIVE 21.03 Restore natural role of fire in wilderness by developing Wildland Fire Use plans for all wilderness areas during this planning period.

GOAL 22 Reduce air pollution impacts to the Air Quality Related Values of the Class I area, James River Face Wilderness, through a cooperative working relationship with agencies managing air quality.

OBJECTIVE 22.01 Conditions of Air Quality Related Values improve over current adversely affected levels.

WILDERNESS AND WILD & SCENIC RIVERS

GOAL 23 Wild, Scenic and Recreation Rivers which are designated by Congress, recommended for designation, or are eligible for designation, will be managed to protect their outstandingly remarkable values and free-flowing condition..

SCENERY

OBJECTIVE 23.01 Complete the suitability study for North Creek and Roaring Branch this decade.

GOAL 24 Obtain full public ownership of lands within wilderness boundaries, including subsurface.

STANDARDS

Wilderness Management

FW-180: Review all Prevention of Significant Deterioration (PSD) permits within 200 km of the Class I area that might affect current AQRV using screening procedures specific to the James River Face Wilderness and federal land manager AQRV guidance.

FW-181: Participate in regional planning organizations (such as VISTAS) that are examining ways to reduce impacts to visibility and other AQRVs in Class I areas of the region.

Wild & Scenic River Management

FW-182: Protect the outstandingly remarkable values and free-flowing condition of the eligible Wild and Scenic River segments.

SCENERY

Public concern for the quality of scenery on the Jefferson National Forest is ever increasing. Many sightseers visit the National Forest as part of an interwoven experience with other tourist opportunities. The mountainous Jefferson National Forest provides many opportunities for high quality, nature-related and rural culture sightseeing and scenic viewing. The vast majority of the forest is covered with an almost continuous canopy, creating a natural-appearing landscape character. Scenic features on the Forest include the Mount Rogers National Recreation Area with its outstanding high mountain balds and Whitetop Mountain, eleven Congressionally designated wilderness areas, over 200 miles of the Appalachian National Scenic Trail, the Mount Rogers National Scenic Byway, the Big Walker National Scenic Byway, 45 miles of the Blue Ridge Parkway, one eligible wild river and nine eligible recreational rivers, the beautiful James River and New River corridors and the Guest River Gorge. Numerous distinctively scenic and historic "special places" of a more localized importance are also available. The Jefferson National Forest offers premier opportunities for wildlife viewing and driving for pleasure.

These highly visible lands, including those adjacent to communities, heavily used waterways, major forest trails, scenic road corridors and major interstate and state highways through the forests, present challenges to land managers. Site-specific project analysis with multi-resource teams and management of lands within a holistic landscape perspective help resolve potential conflicts between scenery management and other resource objectives.

A visual inventory was mapped on Forest lands in the late 1970's and early 1980's using

the Forest Service Visual Management System (VMS). With that inventory, the 1985 Jefferson National Forest Plan established Visual Quality Objectives (VQOs) for management of the visual resource. With over 20 years of research and experience, the VMS was refined and replaced in 1995 by the Scenery Management System (SMS). This system increases the role of constituents throughout the inventory and planning process, and it borrows from and is integrated with basic concepts and terminology of Ecosystem Management. The system provides for improved integration of aesthetics with other biological, physical, and social/cultural resources in the planning process.

Since the initial visual inventory, concern for scenic quality and recreation use increased in many parts of the Forest. To update the inventory, Forest landscape architects and other personnel checked all major roads (interstate, federal, and selected state and Forest roads), major vistas, developed sites, key hiking trails and other identified viewing areas during leaf-off season in the 1990's. Citizens were invited to review the scenery inventory and their comments were considered in the current inventory.

The inventoried combination of viewing distance, concern level and scenic attractiveness on Jefferson National Forest lands, produced Scenic Classes from 1 (the highest level) to 6. Scenic Integrity Objectives (SIOs) were established for each Management Prescription. These are not based on the landscape integrity that exists on the ground, but are an expression of a desired condition. SIOs range from Very High (VH) meaning no alterations to the landscape, to Low (L) meaning moderate alterations to the landscape. In each Management Prescription, a range of SIOs is applied to management activities based on the inventoried Scenic Class. The crosswalk between the new SMS-SIOs and the original VMS-VQOs is displayed in Table 2-13. Standards for SIOs are stated in Chapter 3 for each Management Prescription.

Table 2-13. Relationship between old Visual Management System and new Scenery Management System

SMS - SIOs	Appearance	VMS - VQOs
Very High	Unaltered	Preservation
High	Appears Unaltered	Retention
Moderate	Slightly Altered	Partial Retention
Low	Moderately Altered	Modification

The scenery inventory process will continually refine and update Scenic Classes on a regular basis during project analysis and be incorporated into the database. Implementation of the best available technology will aid future planning for the Forest's scenery. Geographic Information Systems and Global Positioning Systems and other technology based on terrain along with ground-truthing, will be used to aid in determining lands seen from viewpoints, travelways and use areas.

GOALS AND OBJECTIVES:

GOAL 25 Protect and enhance the scenic and aesthetic values of the National Forest lands in the Southern Appalachians.

OBJECTIVE 25.01 Manage the Jefferson National Forest with the following Scenic Integrity Objectives (acres are approximate): Very High 100,000 acres, High 283,000 acres, Moderate 242,000 acres, and Low 98,000 acres.

SCENERY

OBJECTIVE 25.02 Raise 600 acres of Very Low and Unacceptably Low existing scenic integrity to a higher level within this planning period.

GOAL 26 Provide a variety of Landscape Character themes with the predominant themes being Natural Appearing and Natural Evolving including variations of these themes. Maintain smaller enclaves of Pastoral/ Agricultural, Historic/Cultural, Rural/Forested, and Urban landscape character themes.

STANDARDS

Scenery

FW-183: The Scenery Management System guides protection and enhancement of scenery on the Jefferson 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 in Chapter 3 refer to Scenic Class inventory as updated.

FW-184: The Forest Scenic Integrity Objectives (SIOs) Maps govern all new projects (including special uses). Assigned SIOs are consistent with Recreation Opportunity Spectrum management direction. Existing conditions may not currently meet the assigned SIO.

FW-185: 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-186: 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-187: In seed-tree and shelterwood methods, in High and Moderate SIO areas, delay removal of overstory until understory is 10 feet or more in height.

FW-188: Apply leave tree and unit marking to not be visible within 100 feet of concern level 1 and 2 travelways and use areas.

FW-189: 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-190: Design and construct roads to blend with the desired landscape character in form, line, color and texture.

FW-191: During temporary or permanent road construction, eliminate or remove from view, slash and root wads in the immediate foreground in High and Moderate SIO zones to the extent possible. Some slash may be aligned parallel to roads at the base of fill slopes to collect silt.

FW-192: 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-193: Locate bare mineral soil areas from log landings, roads and bladed skid trails out of view from concern level 1 and 2 travelways and use areas, when practical.

FW-194: Cut stems to within approximately 6 inches of the ground when doing roadside maintenance and utility crossing maintenance at roads and trails.

FW-195: Exclude gravel pits and borrow areas from the seen area of visually sensitive concern level 1 and 2 travelways and use areas.

FW-196: Accomplish mowing or bush hogging prior to roadside herbicide treatment in Very High and High SIO areas.

FW-197: Revegetate cut and fill soil slopes.

FW-198: Structures have finishes that reduce contrast with the desired landscape character.

FW-199: Selectively remove trees to improve amenities within high use areas, vista points, and along interpretive trails.

FW-200: When consistent with other objectives, favor flowering and other visually attractive trees and understory shrubs when leaving vegetation.

FW-201: 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-202: When engaged in scenery enhancement activities, introduce or favor native wildflowers, shrubs, and/or trees with showy flowers, fall foliage, and/or fruits.

HERITAGE RESOURCES

The Jefferson National Forest contains a multitude of sites representing past human events. Beginning with Native American occupations dating as earlier as 8000 B.C., the variety of cultural resources is impressive. Prehistoric sites include multi-use base camps, transient camps, hunting and gathering stations, quarries, lithic reduction stations, and rock-shelter occupations. The most common site type is often referred to as a lithic scatter and represents a short-term occupation where stone tools were made and/or sharpened.

Native American sites are found throughout the Forest for the Archaic Period from 8000 B.C. to 1000 B.C. and the Woodland Period from about 1000 B.C. to A.D. 1650. Sites from the Historic Era mark the first explorations by Europeans in the second half of the 17th century with settlement beginning in the second quarter of the 18th century. Historic sites for this period include log cabins and outbuildings associated with agriculture, cemeteries, mills, schools, iron furnace complexes, mines, colliers pits, logging camps, turnpikes, and railroad features. The Jefferson National Forest contains a large number of these historic features as well as later sites relating to the Civilian Conservation Corps. Significant structures on the Jefferson National Forest include the Green Cove Station, the Konnarock Lutheran Girls' School, the Sullivan Tract 19th century farmstead (Settlers Museum of Western Virginia), Glenwood Furnace, Catawba Furnace, Roaring Run Furnace, and Raven Cliff Furnace.

The national "Windows on the Past" program is implemented to improve public understanding of our heritage, to raise public awareness of the fragile and irreplaceable nature of heritage resources, and to provide enhanced public recreation opportunities. Opportunities are provided for the public to observe or to participate in all phases of Forest Service heritage management. The "Passport in Time" program is utilized to involve amateur and professional volunteers in selected aspects of preservation and management efforts. Public outreach and involvement efforts are emphasized with local

HERITAGE RESOURCES

schools and organizations. Partnerships are developed with external organizations, groups, and individuals to provide a public service through heritage resources.

GOALS AND OBJECTIVES:

GOAL 27 The Forest undertakes a systematic program of heritage resource inventory, evaluation, and preservation aimed at the enhancement and protection of significant heritage resource values in compliance with Sections 106 and 110 of the Historic Preservation Act of 1966 as amended (1980). Integration of heritage resource management concerns is emphasized, as is coordination with the public, scientific community, and appropriate Native American and other ethnic groups.

OBJECTIVE 27.01 Develop 10 preservation/maintenance plans for historic administrative and recreational facilities over the next decade.

STANDARDS

Heritage Resources

FW-203: 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-204: Projects are designed to avoid, minimize, or mitigate negative effects on potentially significant heritage resources. In-place protection of identified sites is the minimum requirement until site significance is determined.

FW-205: Evaluations are scheduled and conducted if a project would have any effect on a heritage 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-206: Decision documents (Record of Decision, Decision Notice or Decision Memo) will evidence compliance with the NHPA, 36 CFR 800, and other Heritage-related regulations, as appropriate. A project (or undertaking) not in compliance will be suspended by the Forest Supervisor until compliance is documented.

FW-207: A consultation with the SHPO and Advisory Council on Historic Preservation 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-208: Consultation will include, when necessary, federally recognized Native American tribes with geographic or cultural ties to the Forest, pursuant to provision in the Archeological Resources Protection Act (ARPA), American Indian Religious Freedom Act (AIRFA), Native American Graves Protection and Repatriation Act (NAGPRA), and the Region 8/Region 9 Treatment of Human Remains Policy. Forest Heritage staff will develop mechanisms for consultation. Provide for traditional use or collection of forest resources by Native Americans.

FW-209: A determination of effect, in coordination with SHPO, must be carried out in

the event that a heritage resource determined eligible for or included on the National Register of Historic Places cannot be avoided, or the project delayed, and if the proposed project could affect the property either beneficially or negatively.

FW-210: Ensure that Section 106 compliance clauses are inserted in contracts and sales documents, and that clauses are discussed in pre-work conferences.

FW-211: If additional evidence or information regarding a "not significant" property becomes available, it will be re-evaluated.

RANGELAND RESOURCES

Rangelands on the Jefferson National Forest were established as a result of acquisition of old farms with open fields, bottomland pastures, and the high elevation open grasslands of the Mount Rogers National Recreation Area. These areas continue to be managed for their aesthetic value in providing a pastoral or high elevation alpine-like landscape character. Desired Conditions and Standards for rangeland management are provided for in Management Prescriptions 7G (Pastoral Landscapes), 4K3 (Mount Rogers Crest Zone Special Area), and 4K4 (Whitetop Mountain Special Area).

Sound range management practices also provide healthy forage for both domestic livestock and wildlife, valuable grassland habitat for many species of birds, and numerous recreational opportunities, like hunting, horseback riding, wildlife viewing, photography, picnicking, berry picking, and camping. Soil and water resources are closely monitored and protected. Non-native invasive species are monitored and controlled to the extent possible.

The grazing program on the Forest consists of approximately 8,200 acres of rangelands with capacity to support approximately 10,300 Animal Unit Months. Rangelands are managed in accordance with an approved Allotment Management Plan, which establishes the current and proposed forage species, forage trend data, existing and proposed structures, type of livestock, stocking capacity, season of use, special resource protections, vegetation management, problem areas, and a monitoring plan including an implementation schedule. All grazing use is by permit only and includes development of a variety of livestock control measures and rangeland improvements, like fences, water developments, and vegetation improvements.

GOALS AND OBJECTIVES:

GOAL 28 Sound range management practices help to maintain important forest openings and aesthetically pleasing pastoral settings.

OBJECTIVE 28.01 Maintain 8,200 acres of pastures, old fields, and high elevation meadows through livestock grazing.

OBJECTIVE 28.02 Identify needs for new or replacement rangeland facilities and prioritize opportunities based on effects to resource conditions.

RANGELAND RESOURCES

STANDARDS

Rangeland Resources

MINERALS AND GEOLOGIC RESOURCES

FW-212: Where rangeland facilities or practices are identified as contributing to the degradation of water quality, aquatic species, rare communities, or federally listed or sensitive species habitat, remedial actions may include changes in management strategy, alternation, temporary closure, relocation, or discontinuance of the permit.

FW-213: Term grazing permits are preferred over other permit types because of their stronger controls, management flexibility, and Fee Credit availability.

Additional standards related to grazing and rangelands can be found in Management Prescriptions 7G, 4K3, 4K4, and 11.

MINERALS AND GEOLOGIC RESOURCES

The use of mineral resources is essential to the local, regional and national economy as well as to the public use, management, and sustainability of the National Forest. Congress has passed various laws providing for the exploration and development of mineral resources, including oil and gas, on National Forest System lands. Federal mineral resources are divided into two categories: 1) leasable minerals and 2) mineral materials. Leasable minerals are managed in cooperation with the U.S. Department of Interior, and include oil, gas, coal, metallic minerals, and other hardrock leasable minerals. Mineral materials are managed by the USDA Forest Service, and include road aggregate, landscaping rock, rip-rap, and other earthen construction materials. Mineral materials are used to build and maintain trails, roads, campgrounds; to control erosion and sedimentation; to restore riparian and aquatic habitat; to repair flood damage; etc.

The federal government owns the rights to all minerals on about 88 percent of the Forest acreage. Mineral rights on the remaining 12 percent of the Forest acreage are privately owned (either reserved or outstanding mineral rights). Outstanding mineral rights are property rights that were established and separated from the surface estate prior to the government's acquisition of the surface estate. Reserved mineral rights are established when the federal government (in this case the Forest Service) purchases only the surface estate and the mineral estate remains with the seller. The Forest Service, as surface owner, cannot exclude entry by the mineral estate owner, either permanently or for an unreasonable amount of time. The mineral estate owner has the right to make such use of the surface as is reasonably necessary.

Achieving Forest goals for riparian areas, watersheds, forest health, threatened and endangered species, and rare communities requires understanding of biotic and abiotic components of ecosystems. The Forest Plan will integrate biotic and abiotic (geologic processes, structures, and materials) components to better manage all associated resources. The Forest's geologic resources include caves and other karst features; waterfalls; ancient giant landslides; remnants of volcanic eruptions and the Ice Age; unusual landforms like Dragon's Tooth; paleontologic resources (fossils); springs and groundwater; and the geologic foundations of ecosystems. Geologic hazards are geologic processes that may threaten public safety and damage buildings, roads, bridges, trails, dams and other facilities. Geologic hazards include sinkhole collapse, piping, flooding, earthquakes, and a wide range of landslides: rockfalls, rockslides, debris slides, debris flows, slumps, etc. Recognizing that ground-disturbing activities may cause or contribute to geologic hazards such as landslides, this forest-wide direction is designed so management activities will identify, and avoid aggravation of, geologic hazards that may have impacts on resources and public safety.

GOALS AND OBJECTIVES:

GOAL 29 Manage mineral resources to meet demands for energy and non-energy minerals.

OBJECTIVE 29.01 Energy-related Federal leases, licenses, and permits are processed within 120 days.

OBJECTIVE 29.02 For non-energy mineral resources, emphasize authorizations of minerals needed for environmental protection, public infrastructure, flood protection, erosion control, and watershed restoration.

OBJECTIVE 29.03 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 Condition of the appropriate management prescription.

GOAL 30 On National Forest System tracts where mineral rights are outstanding or reserved, the exercise of private mineral rights to explore and develop mineral resources will be respected.

OBJECTIVE 30.01 Energy-related outstanding and reserved mineral rights operations are processed within 60 days.

GOAL 31 Manage geologic resources to provide multiple public benefits. Manage geologic hazards to protect public safety and facilities while integrating the keystone role of these natural disturbances in riparian and watershed management. Integrate geologic components (processes, structures, and materials) in management of riparian areas, watersheds and ecosystems.

STANDARDS

Geologic Resources

FW-214: Locate and design facilities and management activities to avoid, minimize, or mitigate negative effects on geologic resources with identified values (scientific, scenic, paleontologic, ecological, recreational, drinking water, etc.).

FW-215: Identify, using the appropriate type and scale of geologic mapping, the geologic components (processes, structures, and materials) relevant to proposed projects, and integrate the components into location and design of management activities.

Geologic Hazards

FW-216: Locate, design, and maintain trails, roads, other facilities, and management activities to avoid, minimize, or mitigate potential geologic hazards.

MINERALS AND GEOLOGIC RESOURCES

Federal Leasable Minerals - General

FW-217: 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 future condition of the particular management prescription.

Federal Leasable Minerals - Oil and Gas

FW-218: The Regional Forester makes administratively available and consents to lease those lands on the Forest, which have not been specifically noted as Congressionally withdrawn or administratively unavailable in the management prescriptions listed in Chapter 3. Standard conditions of consent to lease, or stipulations, are used except as noted below and as specified by the individual management prescription. This consent is valid until the Forest Service provides the Bureau of Land Management written notification that consent is being withdrawn or amended.

FW-219: The Regional Forester makes administratively available and consents to lease with a No Surface Occupancy stipulation **semi-primitive non-motorized**, **semi-primitive motorized**, and **semi-primitive 2** areas, which have not been specifically noted as Congressionally withdrawn or administratively unavailable in the management prescriptions, listed in Chapter 3.

FW-220: 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 requirements and regulations promulgated to establish performance standards for protecting soil, water, riparian, and aquatic resources and for reclamation of areas affected by oil and gas activities.

Federal Leasable Minerals - Other than Oil and Gas

FW-221: 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-222: Operations will follow Federal and State rules and regulations promulgated to establish performance standards for protecting soil, water, riparian, and aquatic resources and values; and for restoration and reclamation of areas affected by mining activities. Such rules and regulations include requirements for protection of surface and groundwater quantity and quality; prevention and control of acid mine drainage, erosion, and sediment deposition; and protection of streams and hydrologic balance.

Mineral Materials

FW-223: Mineral materials are available for commercial, personal, free, and administrative uses.

Mineral Collection

FW-224: 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-225: 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-226: 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-227: Management Prescriptions, Management Area Direction, and Forest-wide Direction are subject to outstanding and reserved mineral rights. The government will seek to acquire private mineral rights through purchase, exchange or donation in the following areas: designated Wilderness; designated Wild Rivers; designated Rare Communities 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-228: All projects (mineral or non-mineral) 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-229: Where reserved or outstanding mineral rights are involved, the mineral owner is encouraged to implement all surface-disturbing activities outside riparian areas.

FACILITIES, ROADS AND ACCESS

Almost all visitors to the Jefferson National Forest use forest roads. Even wilderness areas would be inaccessible without roads leading to trailheads. Roads help determine where people will go and what they will see. Driving for pleasure is the single largest recreational use on the Forest.

The fragmented ownership pattern of the Jefferson means Forest Service System roads are an integral part of the rural transportation system and, conversely, State roads are an integral part of the Forest transportation system. Most of the roads on the Jefferson National Forest were originally constructed for access to recreation sites and for timber harvesting. Many were originally built by the Civilian Conservation Corps (CCC). Currently, these roads and their more recent counterparts serve a variety of needs including recreational access, fire protection, vegetation and wildlife management, adjacent private lands access, and energy and mineral development, to name a few.

A forest-wide Roads Analysis, completed for the Jefferson National Forest in January 2003, informed direction in this Forest Plan. Roads analysis is an on-going process. The transportation inventory is continually updated as roads are constructed, reconstructed, relocated, reclassified, or decommissioned. In sensitive areas, decisions related to roads will be informed by watershed-scale or project-scale roads analysis. These areas are identified in Chapter 3. Roads analysis will be conducted concurrently with watershed analysis in priority watersheds. The Forest Supervisor or District Ranger may also decide to perform a watershed-scale or project-scale roads analysis in other areas based on site-specific conditions or issues.

There are 1,215 miles of inventoried and classified National Forest System (NFS) roads

FACILITIES, ROADS, AND ACCESS

Table 2-14. Operational Maintenance Level of Forest Roads

Operational Maintenance Level	Miles
1 - Basic Custodial Care (Closed)	96
2 - High Clearance Vehicles	707
3 - Suitable for Passenger Cars	367
4 - Moderate Degree of User Comfort	31
5 - High Degree of User Comfort	1
Decommissioned	13
Grand Total	1,215

within the Jefferson National Forest. 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. This also includes 13 miles of recently decommissioned road (decommissioned roads were not tracked in the inventory before 1998).

The majority of road work currently performed on the Forest consists of reconstruction of existing roads. New roads are sometimes required (averages less than 4 miles per year), 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. This is desirable as it brings the road bed to a natural condition and eliminates or significantly curtails potential damage to other natural resources. The Jefferson National Forest has been decommissioning about 3 miles of roads per year.

Several roads on the Jefferson National Forest are also used predominantly for other than Forest access. These roads are often 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 Forest access. If more than half of the traffic on a road is other than Forest related, that road is considered a candidate for this process. Road rights-of-way across private land are acquired when opportunities exist. Priority is given to existing system roads, which cross private land with no existing right-of-way.

Facilities (other than roads and trails) managed by the Jefferson National Forest include buildings, kiosks, shelters, etc. located on the National Forest, as well as administrative offices, work centers, etc. in nearby towns and cities. These facilities are designed and maintained to incorporate the principles of sustainability, reflect their place within the natural and cultural landscape, and provide optimal service to customers and cooperators.

GOALS AND OBJECTIVES:

GOAL 32 Provide a transportation system that supplies safe and efficient access to roaded portions of the Jefferson National Forest for forest users while protecting forest resources.

OBJECTIVE 32.01 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.

OBJECTIVE 32.02 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 forest-wide indication of OML 1-2 road conditions.

OBJECTIVE 32.03 Over the next decade, turn over a portion of the 24 miles of forest development roads to the State Department of Transportation, where the majority of traffic is for other than national forest uses.

GOAL 33 Decommission 30 miles of road per decade (classified and unclassified).

OBJECTIVE 33.01 Analyze transportation system within one watershed per year through watershed analysis, and identify roads to be decommissioned. (See also Objective 1.02).

OBJECTIVE 33.02 Priorities for decommissioning are roads causing resource damage and roads in areas where the desired condition is to reduce open road density.

STANDARDS

Access Management

FW-230: All existing open[6] 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;
- ▶ Existing open road density within a management prescription is greater than objective;
- ▶ Use conflicts with management prescription or forest-wide direction;
- ▶ Closures or restrictions are needed to meet other resource needs.
- ▶ Funds will not be available to maintain the road or trail commensurate with Objective Maintenance Level; or
- ▶ Public right-of-way does not exist.

[6] "Open" roads are defined as a motorized travelway (including designated motorized trails) used on a regular basis.

FW-231: New construction of local roads are 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 forest-wide direction considering available financial and personnel resources; or

- Funds are available for maintenance, or cost-sharing or volunteer maintenance can be arranged.

FW-232: 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-233: 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-234: Use staged revegetation during seeding seasons on construction sites where slopes are greater than 5%.

FW-235: All new and reconstructed roads will blend into the landscape to the extent practical.

FW-236: Road construction is not allowed within Semi-Primitive Motorized or Non-Motorized areas except during an emergency or as subject to valid existing rights and leases. (See standards under Recreation Opportunity Spectrum.)

Road Maintenance

FW-237: 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-238: Apply the level of maintenance needed to protect the investment, facilitate resource management, and provide for user safety.

Road Decommissioning

FW-239: Closed system roads are planted with native or desirable non-native wildflowers, forbs, shrubs, and/or grasses.

FW-240: Closed system roads and wildlife linear strips may continue to be used for administrative and emergency access.

Facilities

FW-241: 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-243: 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

All uses of National Forest System (NFS) lands, improvements, and resources, except those governing the disposal of timber, minerals, and the grazing of livestock are designated "special uses". The predominant use is for public roads and utility rights-of-way. Federal and State highways, utility transmission facilities, and communication sites are essential to local, regional, and national economies. 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 are special uses, as are military exercises and training. In addition, recreational activities such as outfitting and guiding and competitive events such as fishing tournaments, foot races, horse endurance races, mountain bike races, etc. also fall into the arena of "special uses."

The utility corridors designated as Prescription Area 5C are linear areas 50-1,000 feet wide to accommodate access for maintenance, to 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 a part of the management area in which they are physically located. Many transmission lines, pipelines, and roads crossing the Jefferson National Forest were in existence prior to acquisition by the Forest Service and are pre-existing rights, not special use permits.

Communication sites are designated as 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).

GOALS AND OBJECTIVES:

GOAL 34 Utility corridors and communication sites on National Forest System lands minimize negative environmental, social, or visual impacts; minimize acres of land affected; are designed using good engineering and technological practices; and clearly benefit society.

GOAL 35 Public lands are easily accessible.

OBJECTIVE 35.01 Acquire right-of-way or fee simple title in lands, as appropriate, to meet access needs.

GOAL 36 National Forest System lands are consolidated to improve management effectiveness and enhance public benefits.

OBJECTIVE 36.01 Through purchase, donation, exchange, right-of-way acquisition, transfer, interchange, and boundary

adjustment, consolidate the National Forest System ownership pattern.

OBJECTIVE 36.02 Acquire lands or interest in lands on a willing seller basis to support specific resource management objectives.

OBJECTIVE 36.03 Exchange or transfer lands or interest in lands that consolidate or provide public benefits.

GOAL 37 Boundary lines are located to Forest Service standards and maintained on a rotational basis.

OBJECTIVE 37.01 Boundary lines are to be surveyed and marked to Forest Service standard, and maintained on a 10-year rotation.

GOAL 38 Resolve all known title claims and encroachments affecting National Forest System lands.

OBJECTIVE 38.01 Title claims and encroachments affecting National Forest System lands are to be documented, prioritized for resolution each fiscal year, and resolved within the constraints of the applicable authority.

STANDARDS

Special Use Authorizations

FW-244: 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-245: Do not allow recreation residences.

FW-246: 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.

Linear Rights-of-Way and Communication Sites

FW-247: 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-248: 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 Prescription Area 5B or 5C.

FW-249: 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-250: 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-251: Require holders of communication use authorizations to remove communications towers no longer in use or determined to be obsolete.

FW-252: Design new corridors and sites to meet a scenic integrity objective as high as practicable.

FW-253: Specify management requirements for permittee access roads in the designated use permit, where roads are included in the authorization.

FW-254: Place distribution lines for utilities underground, unless the environmental impacts of doing so exceed those of placing them above ground.

Land Adjustment

FW-255: 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 and the Mount Rogers National Recreation Area.
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.

LANDS AND SPECIAL USES

FW-256: 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 this Forest Plan.

FW-257: Land conveyances will be guided by the following criteria. Management Prescription 0B outlines the management of small, isolated land areas in Chapter 3 until they can be conveyed to private ownership.

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-258: 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.