

## CHAPTER 2 - ALTERNATIVES

### INTRODUCTION

This chapter describes the nine alternatives considered in detail in this Environmental Impact Statement. The alternatives suggest a variety of scenarios for managing the George Washington National Forest and responding to the significant issues described in Chapter 1. This chapter also explains the alternative development process, provides reasons for why some alternatives were originally considered and then later eliminated from detailed study, describes those alternatives considered in detail, and compares how each alternative responds to the significant issues.

### DEVELOPMENT OF ALTERNATIVES

National Forest Management Act regulations at 36 CFR 219.12(f) state that the interdisciplinary team will formulate a broad ranges of reasonable alternatives and that the primary goal in formulating alternatives, besides complying with NEPA procedures, is to provide an adequate basis for identifying the alternative that comes nearest to maximizing net public benefits, consistent with the resource integration and management requirements of 219.13 through 219.27.

The alternative development process began with the analysis of the need for change described in the Analysis of the Management Situation. From the need for change came an alternative that was briefly described in the Notice of Intent along with the current management, or No Action alternative. The No Action alternative became Alternative A and the alternative developed from the need for change analysis became Alternative B. After the scoping period initiated with the Notice of Intent (March 2010) was completed, the Interdisciplinary Team identified the significant issues. The Interdisciplinary Team then identified alternative ways to address the issues and a range of responses to the issues. This range of responses to the issues was then put together into Alternatives C, D, E and F. A public workshop was held with the Interdisciplinary Team to discuss the alternatives and the alternatives were further refined based on those discussions. Another public workshop was held in October 2010 to address the alternatives. The Forest Leadership Team and Interdisciplinary Team then met to discuss the alternatives to find a preferred alternative. The result of that meeting, and further discussions with the Responsible Official (Regional Forester), resulted in the development of Alternative G as the preferred alternative upon which the Draft Forest Plan was designed. Alternatives H and I were developed following the analysis of comments on the Draft Forest Plan.

Public input supported a Forest Plan based on reasonable budgets so the alternatives were developed with realistic budget flexibilities and workforce capabilities in mind. All alternatives were also required to meet the purpose and need identified in Chapter 1 of the FEIS and address one or more of the significant issues.

### ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED STUDY

Some comments were made that alternatives should be developed that maximize certain resources or resource management activities. Given that the purpose of this analysis is to revise a current Forest Plan that is designed to continue to meet the multiple use mandate, maximization of resources at the expense of other resources does not meet the purpose and need. However, the benchmark analyses addressed in the Analysis of the Management Situation do identify some of the potential benefits and tradeoffs from maximizing some outputs.

Some comments were also made to consider an alternative that involves no management on the Forest, to let natural processes dominate without human intervention. This alternative was not considered in detail because it could not meet the purpose and need identified in Chapter 1 and it could not meet legal requirements of the National Forest Management Act of 1976, the Multiple-Use Sustained Yield Act of 1960 and the Endangered

Species Act of 1973. However, Alternative C does consider a low level of management activities and is considered in detail.

Some comments expressed a desire to see a much higher level of timber production, in order to provide wood products and early seral conditions for wildlife. Although the Forest is capable of producing a sustained yield of a much higher level of timber production (as shown in the Maximum Timber Volume Benchmark in Appendix B), this alternative was not considered in detail, due to concerns that expected budgets could not support that level of production.

Another alternative that was proposed was to have a separate alternative that addresses the actual accomplishments achieved during the past implementation of the current plan. Since many aspects of the current plan were not achieved, this alternative would be different than Alternative A which represents the 1993 Forest Plan direction, rather than actual implementation of the Forest Plan. Rather than developing a separate alternative, the EIS does identify the places where Alternative A differs between its direction and its actual implementation.

## CONSISTENCY WITH RENEWABLE RESOURCES PLANNING ACT

National Forest Management Act regulations at 36 CFR 219.12(f)(6) (1982) state that at least one alternative be developed which responds to and incorporates the Renewable Resource Planning Act (RPA) program tentative resource objectives. The Government Performance and Results Act (GPRA) of 1993 requires federal agencies to prepare strategic plans, which duplicated much of the RPA Program. The Agency no longer prepares an RPA Program but does periodically update its strategic plan that identifies goals, outcomes, performance measures, and strategies applicable to management of the National Forest System. The Agency continues to periodically update the RPA Assessment, which presents national and regional analyses of the renewable resource situation, including projections of supply and demand. However, neither the RPA Assessment nor the Forest Service Strategic Plan contains recommended output targets applicable to individual National Forests. The alternatives evaluated in this FEIS incorporate the broad, strategic objectives of the Forest Service Strategic Plan 2007-2012.

## DEVELOPMENT OF MANAGEMENT AREA PRESCRIPTIONS

Developing a variety of Management Area Prescriptions with different desired conditions, suitable uses and standards to apply to distinct areas of the Forest was the primary method used to formulate a range of alternatives to address the significant issues. The management area prescriptions were largely derived from the management prescriptions used for the Jefferson Forest Plan. The same naming conventions were used and some changes were made to the desired conditions and standards. Table 2-1 lists the full set of management prescriptions allocated in the range of alternatives.

Table 2-1. Management Area Prescriptions Allocated in the Range of Alternatives

Prescription Code	Prescription Description
1A	Designated Wilderness
1B	Recommended Wilderness Study Areas
2C2	Eligible Wild and Scenic Rivers-Scenic
2C3	Eligible Wild and Scenic Rivers-Recreation
4A	Appalachian National Scenic Trail Corridor
4B1	Research Natural Areas
4C1	Geologic Areas
4D	Special Biological Areas
4D1	Key Natural Heritage Community Areas
4E	Cultural Areas
4F	Mount Pleasant National Scenic Area
4FA	Recommended National Scenic Areas
5A	Administrative Sites
5B	Communication Sites
5C	Utility Corridors
7A1	Scenic Byways
7B	Scenic Corridors and Viewsheds
7C	ATV Use Areas
7D	Concentrated Recreation Areas
7E	Dispersed Recreation Areas
7E1	Dispersed Recreation Areas-Unsuitable for Timber Production
7E2	Dispersed Recreation Areas-Suitable for Timber Production
7F	Blue Ridge Parkway Corridor
7G	Pastoral Landscapes
8A1	Mix of Successional Habitats
8A1U	Mix of Successional Habitats-Unsuitable for Timber Production
8B	Early Successional Habitats
8BU	Early Successional Habitats-Unsuitable for Timber Production
8C	Black Bear/Remote Habitats
8CU	Black Bear/Remote Habitats-Unsuitable for Timber Production
8E4a	Indiana Bat-Primary Conservation Areas
8E4b	Indiana Bat-Secondary Conservation Areas
8E7	Shenandoah Mtn Crest-Cow Knob Salamander Area
9A1	Source Water Watershed Protection Areas
10B	Timber Production Areas
10BU	Timber Production Areas-Unsuitable
11	Riparian Corridors
12D	Remote Backcountry Areas
13	Mosaics of Habitat-Suitable for Timber Production
13U	Mosaics of Habitat-Unsuitable for Timber Production

## ALTERNATIVES CONSIDERED IN DETAIL

### Alternative A - No Action Alternative

The 36 CFR 219.12(f)(7) 1982 regulations state that "at least one alternative shall reflect the current level of goods and services provided by the unit and the most likely amount of goods and services expected to be provided in the future if current management direction continues. Pursuant to NEPA procedures, this alternative shall be deemed the 'no action' alternative."

Alternative A represents the 1993 Forest Plan, as amended through ten amendments. In this situation, 'no action' means no change from the current management direction and it provides the baseline for the effects analysis in the EIS. While Alternative A represents the 1993 Plan, it is important to note that annual budgets affect implementation of a Forest Plan. The Analysis of the Management Situation contains a table of accomplishments during the life of the 1993 Forest Plan. In this FEIS, where annual accomplishments have varied substantially from Forest Plan direction and assumptions, the actual accomplishment level will be noted. In addition, where recent budgets have resulted in substantial departures from the plan level of activities an additional column has been added to the tables in the EIS. This column is labeled A<sup>1</sup> and represents the effects of the level of activities accomplished during the past three years (2009 through 2011).

The ten amendments to the 1993 Forest Plan include: Fore Mountain was added to the communication sites in Management Area 20; Laurel Fork Special Management Area was made no longer available for oil and gas leasing; Mount Pleasant was designated as a National Scenic Area; the Biological Opinion for the Indiana Bat was adopted; Jerkentight Road was relocated and dropped as featured Off-Highway Vehicle route; and the remaining amendments were errata or clarifications. Priest and Three Ridges recommended wilderness study areas have been designated as Wilderness since 1993.

The 1993 Forest Plan provides a variety of resource benefits, including wood, wildlife, fish, range, dispersed recreation, developed recreation, minerals, wilderness and special uses, in a manner that maintains the diversity, productivity and long-term sustainability of ecosystems. Maintaining biological diversity is a major goal with standards designed to conserve specific elements of biodiversity and restore others. Conservation of biodiversity is an integral part of sustaining multiple uses of the Forest.

The following are highlights of Alternative A, the 1993 Forest Plan:

#### **ACCESS**

- Road construction 3-8 miles/year (Actual road construction has averaged 1.8 miles/year).

#### **WATER, SOILS, RIPARIAN, AQUATIC DIVERSITY**

- Streamside management zones (66' along perennial and 33' along intermittent streams).
- Municipal watersheds identified, but not highlighted; impaired streams and reservoirs not recognized.

#### **RECREATION**

- Three existing ATV/OHV Use Areas; one additional area planned at Archer Run.
- Large increase in trail construction.
- Featured OHV routes identified and managed for OHV use.
- New developed recreation sites and expansions of existing sites.
- Use of adopted ROS settings.

#### **WILDERNESS/ROADLESS**

- One Recommended Wilderness Study area remains - Saint Mary's Addition South.
- Portions of the Inventoried Roadless Areas are allocated to active management (9%), rest allocated to Remote Backcountry Areas and Special Biological Areas.
- Remote Backcountry prescriptions are not suitable for timber harvest, but do allow some salvage harvest. Road construction is generally prohibited, with limited exceptions.
- About 55% of the Potential Wilderness Areas are in remote settings.

- Since this alternative continues the 1993 Forest Plan direction for the management of the Inventoried Roadless Areas (IRAs), it is recognized that some of the management actions allowed in the IRAs would not be consistent with the 2001 Roadless Area Conservation Rule (RACR).

**TIMBER HARVEST**

- Timber Harvest: ASQ is 23.5 MMBF/year, annual regeneration program of 2,400 acres. Suitable acres are 350,000. Actual average regeneration program has been 629 acres/year (10 year average).
- Utilizes a management area prescription with wood products as the primary management objective.

**TIMBER HARVEST, TERRESTRIAL DIVERSITY, FIRE**

- Amount and location of early successional is based on biodiversity, wood product demand, balanced age class concerns, and desire for increased game populations.

**TERRESTRIAL DIVERSITY**

- Separate management area prescriptions for wildlife: early successional, remote habitat, mosaics of habitat, and small game/watchable wildlife.
- Special Biological Areas are around 90,000 acres.

**OLD GROWTH**

- No old growth management areas.
- Old growth is defined by Forest derived definitions.
- Allowed to harvest on suitable ground in old growth forest type for Dry-Mesic Oak.

**FOREST HEALTH**

- Gypsy moth is the main focus; use of Integrated Pest Management techniques.

**WIND**

- The Plan has no specific direction for wind development.

**OIL AND GAS**

- Of the 995,000 acres available for leasing, approximately 139,000 acres are available under standard lease terms, 815,000 acres are under controlled surface occupancy stipulations and 41,000 acres are under no occupancy stipulations.
- No direction is specifically related to Marcellus shale development.

**ECONOMICS AND LOCAL COMMUNITY**

- Mix of ecosystem services and commodity outputs.

**FIRE**

- Prescribed fire program is 3,000 acres/year. Actual average prescribed burning has been 4,666 acres/year.
- Use of wildfire is allowed to achieve forest goals but no criteria developed.

**CLIMATE CHANGE**

- No direction is specifically related to climate change.
- About 2/3 of Forest is managed to move towards late successional conditions.
- Active management of vegetation structure and composition is predominantly through timber harvest activities.
- Much of Forest is available for development of natural gas production.
- Soil and water improvement are important, but not prioritized by any specific watersheds.

## Alternative B

This alternative is based on changes to the current plan identified in the Analysis of the Management Situation. The analysis was based on an IDT evaluation of the 1993 Forest Plan direction, monitoring and evaluation results, new policies, best available science and an attempt to balance public issues that were identified as of March 2010. The need to change items that were listed in the Notice of Intent in March 2010 to begin preparation of the EIS included the following: 1) Identify desired conditions and objectives to maintain the resilience and function of nine identified ecological systems, determine the desired structure and composition of those ecosystems, and incorporate management direction to provide habitat for maintaining species viability and diversity across the forest; 2) Substantially increase the objective for using prescribed fire in ecosystem restoration and incorporate the use of wildfire for resource enhancement; 3) Move the Remote Backcountry boundaries to match the Inventoried Roadless Area boundaries; 4) Portions of a few Inventoried Roadless Areas (about 8,000 acres), where the boundary of the Inventoried Roadless Areas is along existing roads and the adjacent forest has been actively managed for many years, are proposed to remain in active management rather than in Remote Backcountry; 5) The Remote Backcountry Areas would be managed with standards that are consistent with the timber harvesting and road construction restrictions of the 2001 Roadless Area Conservation Rule (RACR), with the exception that the salvage of dead and dying trees (without the use of road construction) is allowed as long as the roadless character of the area is maintained.

The following are highlights of Alternative B:

### ACCESS

- No net increase in open road miles.
- Road construction of about 1.5 mile per year.
- Road decommissioning 16 miles/year for the first decade. An additional 2 miles of road would be decommissioned if all Recommended Wilderness Study Areas become designated by Congress.

### WATER, SOILS, RIPARIAN, AQUATIC DIVERSITY

- Riparian Areas defined the same as on the Jefferson NF (100' on perennial, 50' on intermittent streams) in all watersheds.
- Drinking water supplies identified. Drinking water watersheds and watersheds above impaired streams and reservoirs negatively affected by acid deposition are a priority for restoration.

### RECREATION

- Three existing ATV/OHV Use Areas; drop planned Archer Run area.
- No net increase in trail miles or maintenance (can increase but would also have to decommission).
- There are no specific roads featured for licensed OHV use but miles would stay at current level.
- No new developed recreation sites; few expansions of existing sites.
- Semi-primitive areas outside of Wilderness, Recommended Wilderness Study Areas or Remote Backcountry Areas do not have limitations on road construction.

### WILDERNESS/ROADLESS

- Recommend Saint Mary's Addition West, Little River, Rich Hole addition, and Ramsey's Draft addition (total 20,000 acres) for Wilderness Study Areas.
- Portions of the Inventoried Roadless Areas are allocated to active management (4%), rest allocated to Remote Backcountry or Special Biological Areas. However, it is recognized that under this alternative, the portions of the IRAs that are allocated to active management may have management activities that would not be consistent with the 2001 Roadless Area Conservation Rule (RACR).
- The Remote Backcountry Areas are generally managed with timber harvest and road construction restrictions that are consistent with the 2001 RACR. However, under this alternative there would be an exception to allow for salvage harvests (which for those areas that are also in IRAs, this exception would not be consistent with the 2001 RACR).
- Most of the additional Potential Wilderness Areas in current active management would remain in active management.

**TIMBER HARVEST**

- The ASQ is around 27.9 MMBF/year, annual regeneration program of 1,800-3,000 acres. Suitable acres are 486,000.
- Primary purpose of timber harvest is to support other resource objectives.

**TIMBER HARVEST, TERRESTRIAL DIVERSITY, FIRE**

- Amount and location of early successional habitat is based primarily on ecological objectives and restoration objectives.

**TERRESTRIAL DIVERSITY**

- One broad management area prescription for wildlife habitat emphasis.
- About 118,000 acres of Special Biological Areas.

**OLD GROWTH**

- No old growth management areas. Old growth is defined by Regional definitions.
- Most of the stands meeting the old growth definition are unsuitable for timber production. Areas in the most common forest type (Dry-Mesic Oak Forests) that are on lands suitable for timber production could be considered for harvest.

**FOREST HEALTH**

- Increased recognition of non-native invasive species; use of Integrated Pest Management techniques.

**WIND**

- Areas not suitable for wind development: Wilderness, Recommended Wilderness Study Areas, Eligible Scenic River Corridors, Eligible Recreation River Corridors, Appalachian Trail Corridor, Research Natural Areas, Geologic Areas, Mount Pleasant National Scenic Area, Special Biological Areas, Developed Recreation Areas, Blue Ridge Parkway Corridor, Shenandoah Mountain Crest-Cow Knob Salamander Area, Indiana Bat Protection Areas, and Remote Backcountry Areas.

**OIL AND GAS**

- Of the 983,000 acres available for leasing, approximately 615,000 acres are available under standard lease terms, 152,000 acres are under controlled surface occupancy stipulations and 202,000 acres are under no occupancy stipulations and 14,000 are under a timing stipulation.
- Horizontal drilling (Marcellus shale development) is allowed on all available acres but specific standards related to hydraulic fracturing would be used.

**ECONOMICS AND LOCAL COMMUNITY**

- Similar to Alternative A.

**FIRE**

- Prescribed fire program between 12,000 and 20,000 acres/year.
- Utilize fire to attain ecological objectives for biodiversity when appropriate.

**CLIMATE CHANGE**

- Impaired streams and reservoirs are priority for restoration; actively restore (chestnut, yellow pine, hemlock, spruce, riverfront hardwoods, beaver meadows, fire dependent and adapted communities, open woodlands, TESLR species).
- Timber harvest, fire, and grassland/shrubland maintenance are used to manage vegetation structure and composition to improve resiliency of the ecosystems.

## Alternative C

In this alternative, restoration and maintenance of sustainable ecological systems is accomplished predominantly through natural processes, with little human intervention. It also addresses the need for non-motorized recreation opportunities. This alternative emphasizes low-impact activities and passive restoration of natural communities at a slow rate. Active management is for the protection of Forest resources and meeting legal requirements, with limited exceptions. Recreation emphasis is on semi-primitive settings and opportunities. This alternative features the most area Recommended for Wilderness Study. The character will be of a landscape evolving through successional stages toward a natural-evolving appearance. This alternative also emphasizes linking together movement corridors and large undisturbed areas for forest interior species and late-successional species. Effects of native insects and diseases are accepted but non-native species are controlled. Road network mileage is reduced through closure or decommissioning of roads not needed for ecosystem stewardship, restoration or dispersed recreation use. Many of the closed roads are used to supplement the trail system for non-motorized uses.

This alternative does not allow any new federal oil and gas leasing. The approximately 10,200 acres (or 1 percent of the GWNF) of mineral rights that are under current federal oil and gas leases will continue to be legally available for federal oil and gas leasing. The approximately 167,200 acres (or 16 percent of the GWNF) of mineral rights that are owned by private parties (also called outstanding or reserved) are constitutionally protected property rights.

The following are highlights of Alternative C:

### ACCESS

- Extensive road closure or decommissioning; but some access is still needed for non-motorized activities.
- No road construction.
- Road decommissioning 16 miles/year for first decade. An additional 147 miles of road would be decommissioned if all Recommended Wilderness Study Areas become designated by Congress.

### WATER, SOILS, RIPARIAN, AQUATIC DIVERSITY

- Riparian areas are the same as on Jefferson NF (100' on perennial, 50' on intermittent streams) but buffers are larger in source drinking watersheds and along impaired streams.
- Drinking water watersheds are allocated to a management area prescription where these management areas and watersheds above impaired streams and reservoirs are a priority for restoration and include management activity restrictions.

### RECREATION

- Three existing ATV/OHV Use Areas; drop planned Archer Run area.
- Increase in trails for non-motorized users but no net increase in maintenance (by relocating or decommissioning unsustainable trails).
- No management of roads for OHV use.
- No new developed recreation sites, closure of some sites.
- Maintain inventoried semi-primitive acres and move towards a primitive ROS setting in the Shenandoah Mountain area.

### WILDERNESS/ROADLESS

- High level of Recommended Wilderness Study Areas (380,000 acres), including all of the Potential Wilderness Areas.
- Remote Backcountry Areas will be managed with timber harvest and road construction restrictions that are consistent with the 2001 RACR.

### TIMBER HARVEST

- No ASQ or suitable land base.
- No commercial timber program but incidental harvest may occur.



**TIMBER HARVEST, TERRESTRIAL DIVERSITY, FIRE**

- Creation of early successional habitat through harvest of trees is very limited, only for threatened and endangered species and limited sensitive species habitat.

**TERRESTRIAL DIVERSITY**

- No management area is defined for wildlife or timber since most of the forest will provide for forest interior species and late-successional species; emphasis is to minimize fragmentation and edge effects.
- About 118,000 ac of Special Biological Areas plus about 17,000 acres for wood turtle habitat.

**OLD GROWTH**

- No old growth management areas. Old growth is defined by Regional definitions.
- No harvest of any stands meeting the definition of old growth forest.

**FOREST HEALTH**

- Heavy emphasis on prevention of the introduction and minimizing the spread of non-native invasive species, especially in remote settings. Increased emphasis on non-motorized recreation may require aggressive prevention measures in concentrated use areas. Limited use of herbicides and insecticides.

**WIND**

- No wind development allowed.

**OIL AND GAS**

- The approximately 167,200 acres (or 16% of the GWNF) of mineral rights that are owned by private parties (also called outstanding or reserved mineral rights) are constitutionally protected property rights and would not be affected by implementation of this alternative.
- The approximately 10,200 acres (or 1 percent of the GWNF) of mineral rights that are under current federal oil and gas leases would not be affected by implementation of this alternative.
- The approximately 51,000 acres (or 5% of the GWNF) that are congressionally withdrawn from mineral entry (i.e. Wilderness, and Mount Pleasant Scenic Area) would continue to be legally unavailable for federal oil and gas leasing.
- All other areas would be administratively unavailable for federal oil and gas leasing.

**ECONOMICS AND LOCAL COMMUNITY**

- Fewer commodity outputs, focus is on remote non-motorized recreation and ecosystem services outputs.

**FIRE**

- Very limited use of prescribed fire, primarily for TES species.
- Allow wildfires to burn as much as possible.

**CLIMATE CHANGE**

- Passive restoration through natural processes; manage most of the forest to move towards late successional conditions.
- Reduce access to the forest to limit introduction and spread of invasives.
- Decommissioning of roads to reduce potential sedimentation in streams.
- Less fragmentation to increase connectivity of migration corridors for species that rely on mature, closed canopy forests.

## Alternative D

In this alternative, restoration and maintenance of natural ecological systems uses practices that also produce a higher level of commodities and offers amenities that enhance tourism for local communities that benefit economically from forest visitors and forest products. This alternative has the highest level of timber production. A mixture of timber outputs is focused on species/product combinations with strong demand. Mineral leasing decisions respond to public need and maximize benefits to local communities. Mitigation measures for the effects of climate change are met through providing opportunities for alternative energy, such as wind power, natural gas, timber and wood biomass energy. Public access (travelways, use corridors, waterways, and trails - including off-highway vehicles) are increased in high-use areas and/or improved to provide for more opportunities for recreation and other forest uses to occur when compatible with other resources. Additional roads may be needed to support the production of wood products and natural gas development. Roads are still analyzed for decommissioning but opportunities for using unneeded roads for trail access are preferable. Habitats are provided for game species, species with high public interest, species with demanding habitat requirements, species that are ecological indicators and keystone species. Management direction supports special use requests for facilities or developments that enhance economic development for local communities, such as communications towers or non-commercial wind towers. This alternative responds to public desires for more accessibility to National Forest System lands.

The following are highlights of Alternative D:

### ACCESS

- Some road construction to support tourism opportunities and commodity production.
- Road construction about 4 miles/year; road decommissioning 8 miles/year. An additional 6 miles of road would be decommissioned if all Recommended Wilderness Study Areas become designated by Congress.

### WATER, SOILS, RIPARIAN, AQUATIC DIVERSITY

- Riparian areas same as on Jefferson NF (100' on perennial, 50' on intermittent streams) in watersheds with threatened and endangered aquatic species. Current plan standards apply in the rest of the forest.
- Drinking water watersheds identified per State designation are a priority for restoration activities, along with watersheds above impaired streams and reservoirs.

### RECREATION

- Three existing ATV/OHV Use Areas; more than one new area could be planned.
- Increase in trails for tourism, such as long distance, connected trails for user events.
- Featured OHV routes are identified and managed for OHV use.
- No new developed recreation sites but offer more amenities at existing sites.
- Semi-primitive areas outside Wilderness, Recommended Wilderness Study Areas or Remote Backcountry Areas do not have limitations on road construction.

### WILDERNESS/ROADLESS

- Low level of Recommended Wilderness Study Areas (14,000 acres), determined by additions to existing Wilderness, areas with unique visitor draws, and Rockbridge Co. Board of Supervisors recommended areas.
- Portions of the Inventoried Roadless Areas are allocated to active management, rest allocated to Remote Backcountry or Special Biological Areas. However, it is recognized that under this alternative, the portions of the IRAs that are allocated to active management may have management activities that would not be consistent with the 2001 RACR. Most of the additional Potential Wilderness Areas in current active management remain in active management.
- The Remote Backcountry Areas are managed with timber harvest and road construction restrictions that are consistent with the 2001 RACR. However, under this alternative there would be an exception to allow for salvage harvest (which would not be consistent with the 2001 RACR).

**TIMBER HARVEST**

- ASQ around 52.9 MMBF/year. Annual regeneration program of 3,000-5,000 acres. Suitable acres are 482,000.
- Utilize a management area prescription with timber as the primary management objective.

**TIMBER HARVEST, TERRESTRIAL DIVERSITY, FIRE**

- Amount and location of early successional is based on wood product demand, balanced age class concerns, increased game populations, and restoration objectives.

**TERRESTRIAL DIVERSITY**

- Separate management area prescriptions for wildlife: early successional, remote habitat, mosaics of habitat, small game/watchable wildlife; perhaps add one specifically for grouse.
- About 118,000 acres of Special Biological Areas.

**OLD GROWTH**

- No old growth management areas. Old growth is defined by Regional definitions.
- Most of the stands meeting the old growth definition are unsuitable for timber production. Areas in the most common forest types (Dry-Mesic Oak Forests and Dry and Dry-Mesic Oak-Pine Forests) that are on lands suitable for timber production could be considered for harvest.

**FOREST HEALTH**

- Aggressive treatment of non-native invasive species; use of Integrated Pest Management techniques; emphasis on minimizing spread to adjacent private lands; aggressive prevention and control in disturbed areas or high use areas.

**WIND**

- Wind development is suitable across much of the forest where there is a high potential for wind development; several Inventoried Roadless Areas would also be available for wind development; however, it is recognized that any road construction needed to support wind development would not be consistent with the 2001 RACR.

**OIL AND GAS**

- Of the 981,000 acres available for leasing, approximately 609,000 acres are available under standard lease terms, 157,000 acres are under controlled surface occupancy stipulations, 201,000 acres are under no occupancy stipulations and 14,000 acres are under a timing stipulation.
- Horizontal drilling (Marcellus shale development) is allowed on all available acres but specific standards related to hydraulic fracturing would be used.

**ECONOMICS AND LOCAL COMMUNITY**

- Increase in commodity outputs related to wood, minerals. Also emphasize alternative energy and tourism, including motorized recreation.

**FIRE**

- Use prescribed fire on unsuitable acres and timber management on suitable acres to achieve ecological objectives; prescribed fire program between 5,000 and 12,000 acres/year.
- Utilize fire to attain ecological objectives for biodiversity when appropriate, but minimize burning of lands suitable for timber production.

**CLIMATE CHANGE**

- Increase opportunities for climate change mitigation (alternative energy sources such as wind, oil and gas leasing and Marcellus Shale development).
- Source drinking watersheds and impaired waters are priority for restoration.
- Actively restore (chestnut, yellow pine, hemlock, spruce, riverfront hardwoods, beaver meadows, fire dependent and adapted communities, open woodlands, TESLR species). Timber harvest, fire, and grassland/shrubland maintenance are used to manage vegetation structure and composition to improve resiliency of the ecosystems.

## Alternative E

Alternative E actively restores and maintains vegetative compositional and structural conditions needed to provide for a variety of terrestrial and aquatic species in certain areas of the forest. Prescribed fire, timber harvest and maintenance of grasslands and shrublands are all used to provide a diverse mix of habitats in the ecological systems. In some areas of the forest large blocks of mature forest predominate. Alt E emphasizes improving soil and water concerns in high priority watersheds. As a result of restoration treatments, commodities such as sawlogs, wood biomass energy, and fuelwood are available for local industry and individual needs. Restoration activities such as prescribed fire and thinning are more intensive than in the other alternatives. A variety of recreation settings occur in areas compatible with restoration activities. New recreation developments are limited; the emphasis is on maintaining existing developments.

The following are highlights of Alternative E:

### ACCESS

- No net increase in open road miles.
- Road construction is 1 mile/year.
- Road decommissioning is 16 miles/year. An additional 4 miles of road would be decommissioned if all Recommended Wilderness Study Areas become designated by Congress.

### WATER, SOILS, RIPARIAN, AQUATIC DIVERSITY

- Riparian Areas same as on Jefferson (100' on perennial, 50' on intermittent streams) in all watersheds.
- Priority watersheds are identified based on water use (sensitive aquatic species, drinking water), impairment (particularly acid deposition), and sensitivity are a priority for restoration activities.

### RECREATION

- Three existing ATV/OHV Use Areas; drop planned Archer Run area.
- No net increase in trail miles or maintenance, focus on relocating or decommissioning of unsustainable trails.
- No management of roads for OHV use.
- No new developed recreation sites, closure of some sites located in floodplains.
- Maintain inventoried semi-primitive acres.

### WILDERNESS/ROADLESS

- Recommended Wilderness Study Areas (24,000 acres) include Little River and additions to Rich Hole, Rough Mountain, Ramsey's Draft, Saint Mary's, and Three Ridges.
- Portions of the Inventoried Roadless Areas are allocated to active management, rest allocated to Remote Backcountry and Special Biological Areas. However, it is recognized that under this alternative, the portions of the IRAs that are allocated to active management may have management activities that would not be consistent with the 2001 Roadless Area Conservation Rule (RACR). Most of the additional Potential Wilderness Areas in current active management would remain in active management.
- The Remote Backcountry Areas are managed with timber harvest and road construction restrictions that are consistent with the 2001 RACR.

### TIMBER HARVEST

- ASQ around 15.5 MMBF/year, annual regeneration program of 1,800-3,000 acres. Suitable acres are 366,000.
- Primary purpose of timber harvest is to support other resource objectives.

### TIMBER HARVEST, TERRESTRIAL DIVERSITY, FIRE

- Amount and location of early successional is based on ecological objectives, and restoration objectives.

**TERRESTRIAL DIVERSITY**

- One broad management area prescription for wildlife habitat emphasis.
- About 118,000 acres of Special Biological Areas.

**OLD GROWTH**

- No old growth management areas. Old growth is defined by Regional definitions.
- Stands meeting the definition of old growth forests are not suitable for timber production, but trees in these stands can be cut to actively restore structural conditions.
- The Peters Mountain and Frozen Head areas (with boundaries modified from the Virginia DCR proposal) are unsuitable for timber production.

**FOREST HEALTH**

- Aggressive treatment of non-native invasive species; use of Integrated Pest Management techniques; emphasis on minimizing spread to adjacent private lands; aggressive prevention and control in disturbed areas or high use areas.

**WIND**

- No wind development allowed.

**OIL AND GAS**

- Of the 980,000 acres available for leasing, approximately 535,000 acres are available under standard lease terms, 160,000 acres are under controlled surface occupancy stipulations, 271,000 acres are under no occupancy stipulations and 14,000 acres are under a timing stipulation.
- No areas are available for horizontal drilling (Marcellus shale development).

**ECONOMICS AND LOCAL COMMUNITY**

- Focus is on outputs of ecosystem services, but this results in some increase in timber commodity outputs.

**FIRE**

- Prescribed fire program around 20,000 acres/year based on ecological objectives.
- Favor use of wildfire to achieve ecological objectives instead of aggressive suppression.

**CLIMATE CHANGE**

- Increase activities to adapt to climate change (improve ecosystem resiliency, restore vegetation composition and structure, aggressive treatment of invasive species).
- Source drinking watersheds and impaired waters are priority for restoration.
- Relocation or closure of some recreation sites in floodplains.
- A factor to consider in amount of Recommended Wilderness Study Areas is the desire for future flexibility.
- Actively restore (chestnut, yellow pine, hemlock, spruce, riverfront hardwoods, beaver meadows, fire dependent and adapted communities, open woodlands, TESLR spp).
- Timber harvest, fire and grassland/shrubland maintenance are used to manage vegetation structure and composition to improve resiliency of the ecosystems.

## Alternative F

This alternative restores and maintains the native ecological systems while also creating many opportunities for a variety of recreation settings. The emphasis is on recreation opportunities, scenery management, and wilderness designation, while focusing ecosystem health activities in support of wildlife-based recreation. Resource management is designed to attract recreation users, both locally and from large population centers near the forest. A variety of recreation settings and experiences, both motorized and non-motorized are provided. Developed recreation facilities support dispersed recreation by providing access to water-based recreation, trailheads, cultural resource interpretation, and horse staging areas. In addition to open roads available for use, specific off-highway vehicle routes are featured. Large blocks of unroaded areas provide remote backcountry experiences not available on private lands. Habitat for early successional species is maintained in a manner that would be unnoticeable to most forest visitors. High scenic quality is a major emphasis. Active resource management is concentrated in certain locations and supports recreation use and visual quality.

The following are highlights of Alternative F:

### ACCESS

- No net increase in open road miles.
- Road construction 0.5 miles/year.
- Road decommissioning 16 miles/year. An additional 26 miles of road would be decommissioned if all Recommended Wilderness Study Areas become designated by Congress.

### WATER, SOILS, RIPARIAN, AQUATIC DIVERSITY

- Riparian Areas same as on Jefferson (100' on perennial, 50' on intermittent streams) in all watersheds.
- Drinking water watersheds identified per State designation are a priority for restoration activities, along with watersheds above impaired streams and reservoirs.

### RECREATION

- Three existing ATV/OHV Use Areas; trails would be expanded in these areas; drop planned Archer Run area.
- Increase in trails for all users but no net increase in maintenance (by relocating or decommissioning unsustainable trails).
- Specific roads not featured for OHV routes but miles would stay at current level.
- No new developed recreation sites; few expansions of existing sites.
- Maintain inventoried semi-primitive acres.

### WILDERNESS/ROADLESS

- High amount of Recommended Wilderness Study Areas (113,000 acres) include Beech Lick, Three High Heads, Laurel Fork, Little Alleghany, Little River, Oliver Mountain, Potts Mountain, Three Sisters, Whites Peak and additions to Rich Hole, Rough Mountain, Ramsey's Draft, Saint Mary's, and Three Ridges.
- Incorporate Shenandoah Mountain Proposal including both National Scenic Areas and wilderness area recommendations.
- All of the Inventoried Roadless Areas would be Recommended Wilderness Study Areas, Remote Backcountry or Special Biological Areas. Some of the additional Potential Wilderness Areas in current active management would remain in active management.
- The Remote Backcountry Areas would be managed with timber harvest and road construction restrictions that are consistent with the 2001 Roadless Area Conservation Rule (RACR).

### TIMBER HARVEST

- ASQ around 9.6 MMBF/year, annual regeneration program of 1,000-1,800 acres. Suitable acres are 278,000.
- Primary purpose of timber harvest is to support other resource objectives.

**TIMBER HARVEST, TERRESTRIAL DIVERSITY, FIRE**

- Amount and location of early successional based on wildlife needs, ecological objectives, and restoration objectives.

**TERRESTRIAL DIVERSITY**

- One broad management area prescription for wildlife habitat emphasis.
- About 118,000 acres of Special Biological Areas.

**OLD GROWTH**

- Old growth would be allocated to a management prescription for old growth. Old growth defined by Regional definitions.
- No harvest of any stands meeting the definition of old growth forest.
- The Peters Mountain and Frozen Head areas (boundaries as identified by the Virginia DCR proposal) are unsuitable for timber production.

**FOREST HEALTH**

- Aggressive treatment of non-native invasive species; use of Integrated Pest Management techniques; emphasis on minimizing spread to adjacent private lands; aggressive prevention and control in disturbed areas or high use areas.

**WIND**

- Areas not suitable for wind development: Wilderness, Recommended Wilderness Study Areas, Eligible Scenic River Corridors, Eligible Recreation River Corridors, Appalachian Trail Corridor, Research Natural Areas, Geologic Areas, Mount Pleasant National Scenic Area, Special Biological Areas, Developed Recreation Areas, Blue Ridge Parkway Corridor, Shenandoah Mountain Crest-Cow Knob Salamander Area, Indiana Bat Protection Areas, and Remote Backcountry Areas.

**OIL AND GAS**

- Of the 763,000 acres available for leasing, approximately 495,000 acres are available under standard lease terms, 105,000 acres are under controlled surface occupancy stipulations, 149,000 acres are under no occupancy stipulations and 14,000 acres are under a timing stipulation.
- Horizontal drilling (Marcellus shale development) is allowed on all available acres (except within public water supplies) but specific standards related to hydraulic fracturing would be used.

**ECONOMICS AND LOCAL COMMUNITY**

- Similar to Alternative A.

**FIRE**

- Prescribed fire program between 12,000 and 20,000 acres/year.
- Utilize fire to attain ecological objectives for biodiversity when appropriate.

**CLIMATE CHANGE**

- Source drinking watersheds and impaired waters are priority for restoration.
- Actively restore (chestnut, yellow pine, hemlock, spruce, riverfront hardwoods, beaver meadows, fire dependent and adapted communities, open woodlands, TESLR spp).
- Timber harvest, fire, and grassland/shrubland maintenance are used to manage vegetation structure and composition to improve resiliency of the ecosystems.

## Alternative G

Alternative G was developed after reviewing public comments and agency concerns identified throughout the process leading up to the development of the Draft EIS. It was identified as the Preferred Alternative in the Draft EIS. Each significant issue was reviewed in relation to how it was addressed by the various alternatives, the environmental effects of the alternative in relation to the issue, and the benefits or outputs related to the issue. This alternative contains aspects of each of the other alternatives.

This alternative provides a variety of resource benefits, including wood, wildlife, fish, range, dispersed recreation, developed recreation, minerals, wilderness and special uses, in a manner that maintains the diversity, productivity and long-term sustainability of ecosystems. It actively restores and maintains vegetative compositional and structural conditions needed to provide for a variety of terrestrial and aquatic species in certain areas of the forest. Habitats are provided for game species, species with high public interest, species with demanding habitat requirement, species that are ecological indicators and keystone species. It substantially increases the objective for using prescribed fire in ecosystem restoration and incorporates the use of wildfire for resource enhancement. Prescribed fire, timber harvest and maintenance of grasslands and shrublands are used to provide a diverse mix of habitats in the ecological systems. In some areas of the forest large blocks of mature forest predominate. Restoration treatments focus on increasing structural diversity in ecological systems and on improving soil and water concerns in high priority watersheds. As a result of restoration treatments, commodities such as sawlogs, wood biomass energy, and fuelwood are available for local industry and individual needs.

Road network mileage is reduced through closure or decommissioning of roads not needed for ecosystem stewardship, restoration or dispersed recreation use. Many of the closed roads are used to supplement the trail system for non-motorized uses. All of the Inventoried Roadless Areas are managed with timber harvest and road construction restrictions that are consistent with the 2001 Roadless Area Conservation Rule (RACR).

Resource management is designed to attract recreation users, both locally and from large population centers near the forest. A variety of recreation settings and experiences, both motorized and non-motorized is provided. Large blocks of unroaded areas provide remote, backcountry experiences not available on private lands. High scenic quality is a major emphasis.

The following are highlights of Alternative G:

### ACCESS

- No net increase in open road miles.
- Road construction 1.5 miles/year.
- Decommissioning 16 miles/year. An additional 2 miles of road would be decommissioned if all Recommended Wilderness Study Areas become designated by Congress.

### WATER, SOILS, RIPARIAN, AQUATIC DIVERSITY

- Riparian Areas same as on Jefferson (100' on perennial, 50' on intermittent streams) in all watersheds.
- Priority watersheds identified based on sensitive aquatic species, drinking water use identified by state agencies, impairment identified by state agencies that can be addressed by management activities on the Forest are a priority for restoration activities.

### RECREATION

- Three existing ATV/OHV Use Areas; possible expansion of existing areas to provide stacked loops based on difficulty level and single track riding opportunities; drop planned Archer Run area.
- No net increase in trail maintenance, focus on relocating or decommissioning unsustainable trails, decommissioning low use trails, adding stacked loops within existing trail systems, providing connectors between existing trails, and, if feasible, providing trailheads near population centers and/or major road routes.
- High clearance roads remain available for OHV use at current levels.



- No new developed recreation sites, few expansions at existing sites.
- Maintain most of the inventoried semi-primitive acres.

**WILDERNESS/ROADLESS**

- Recommend Saint Mary's Addition West, Little River, Rich Hole addition and Ramsey's Draft addition (total 20,000 ac) for Wilderness Study Areas.
- All Inventoried Roadless Areas not Recommended for Wilderness Study or Special Biological Areas are allocated to Remote Backcountry and managed with timber harvest and road construction restrictions that are consistent with the 2001 RACR.
- Areas in Potential Wilderness Areas (and not in Inventoried Roadless Areas) are allocated to a variety of management prescription areas including Remote Backcountry and Mosaics of Wildlife Habitat.

**TIMBER HARVEST**

- ASQ around 27.6 MMBF/year, annual regeneration program of 1,800-3,000 acres. Suitable acres are 439,000.
- Primary purpose of timber harvest is to support other resource objectives with a secondary purpose of providing wood products.

**TIMBER HARVEST, TERRESTRIAL DIVERSITY, FIRE**

- Amount and location of early successional is based on ecological objectives, and restoration needs.

**TERRESTRIAL DIVERSITY**

- One broad management area prescription for wildlife habitat emphasis.
- About 118,000 acres of Special Biological Areas.

**OLD GROWTH**

- No old growth management area. Old growth is defined by Regional definitions.
- Most of the stands meeting the old growth definition are unsuitable for timber production. Areas in the common forest types (Dry-Mesic Oak Forests and Dry & Dry-Mesic Oak-Pine Forests) that are on lands suitable for timber production could be considered for harvest.
- The Peters Mountain and Frozen Head areas (boundaries modified from the Virginia DCR proposal) are unsuitable for timber production.

**FOREST HEALTH**

- Aggressive treatment of non-native invasive species; use of Integrated Pest Management techniques; emphasis on minimizing spread to adjacent private lands; aggressive prevention and control in disturbed areas or high use areas.

**WIND**

- Areas not suitable for wind development: Wilderness, Recommended Wilderness Study Areas, Eligible Scenic River Corridors, Eligible Recreation River Corridors, Appalachian Trail Corridor, Research Natural Areas, Geologic Areas, Mount Pleasant National Scenic Area, Special Biological Areas, Developed Recreation Areas, Blue Ridge Parkway Corridor, Shenandoah Mountain Crest-Cow Knob Salamander Area, Indiana Bat Protection Areas, and Remote Backcountry Areas.

**OIL AND GAS**

- Of the 983,000 acres available for leasing, approximately 550,000 acres are available under standard lease terms, 161,000 acres are under controlled surface occupancy stipulations, 259,000 acres are under no occupancy stipulations and 14,000 acres are under a timing stipulation.
- No areas are available for horizontal drilling (Marcellus shale development).

**ECONOMICS AND LOCAL COMMUNITY**

- Focus is on outputs of ecosystem services, but this results in some increase in timber commodity outputs.

**FIRE**

- Prescribed fire program between 12,000 and 20,000 acres/year.
- Utilize wildfire to attain ecological objectives for biodiversity when appropriate.

**CLIMATE CHANGE**

- Increase activities to adapt to climate change (improve ecosystem resiliency, restore vegetation composition and structure, aggressive treatment of invasives).
- Source drinking watersheds and impaired waters are a priority for restoration.
- A factor to consider in amount of recommended wilderness study areas is the desire for future flexibility.
- Actively restore (chestnut, yellow pine, hemlock, spruce, riverfront hardwoods, beaver meadows, fire dependent and adapted communities, open woodlands, TESLR spp).
- Timber harvest, fire and grassland/shrubland maintenance are used to manage vegetation structure and composition to improve resiliency of the ecosystems.

## Alternative H

Alternative H was developed after reviewing public comments received after release of the Draft EIS. It is based on Alternative G with changes made in response to the comments and new information.

This alternative provides a variety of resource benefits, including wood, wildlife, fish, range, dispersed recreation, developed recreation, minerals, wilderness and special uses, in a manner that maintains the diversity, productivity and long-term sustainability of ecosystems. It actively restores and maintains vegetative compositional and structural conditions needed to provide for a variety of terrestrial and aquatic species in certain areas of the forest. Habitats are provided for game species, species with high public interest, species with demanding habitat requirements, species that are ecological indicators and keystone species. It substantially increases the objective for using prescribed fire in ecosystem restoration and allows wildfire to achieve ecological objectives for resource enhancement when appropriate. Prescribed fire, timber harvest and maintenance of grasslands and shrublands are all used to provide a diverse mix of habitats in the ecological systems. In some areas of the forest large blocks of mature forest predominate. Restoration treatments focus on increasing structural diversity in ecological systems and on improving soil and water concerns in high priority watersheds. As a result of restoration treatments, commodities such as sawlogs, wood biomass energy, and fuelwood are available for local industry and individual needs.

Road network mileage is reduced through closure or decommissioning of roads not needed for ecosystem stewardship, restoration or dispersed recreation use. Many of the closed roads are used to supplement the trail system for non-motorized uses. All of the Inventoried Roadless Areas are managed with timber harvest and road construction restrictions that are consistent with the 2001 Roadless Area Conservation Rule (RACR).

Resource management is designed to attract recreation users, both locally and from large population centers near the forest. A variety of recreation settings and experiences, both motorized and non-motorized is provided. Large blocks of unroaded areas provide remote, backcountry experiences not available on private lands. High scenic quality is a major emphasis.

The following are highlights of Alternative H:

### ACCESS

- No net increase in open road miles.
- Road construction 1.5 miles/year.
- Decommissioning 16 miles/year. An additional 4 miles of road would be decommissioned if all Recommended Wilderness Study Areas become designated by Congress.

### WATER, SOILS, RIPARIAN, AQUATIC DIVERSITY

- Riparian Areas same as on Jefferson (100' on perennial, 50' on intermittent streams) in all watersheds.
- Priority watersheds that are identified based on sensitive aquatic species, drinking water use identified by state agencies, and impairment identified by state agencies that can be addressed by management activities on the Forest are a priority for restoration activities.

### RECREATION

- Three existing ATV/OHV Use Areas; possible expansion of existing areas to provide stacked loops based on difficulty level and single track riding opportunities; drop planned Archer Run area.
- No net increase in trail maintenance, focus on relocating or decommissioning unsustainable trails, decommissioning low use trails, adding stacked loops within existing trail systems, providing connectors between existing trails, and, if feasible, providing trailheads near population centers and/or major road routes.
- High clearance roads remain available for OHV use at current levels.
- No new developed recreation sites, few expansions at existing sites.
- Maintain most of the inventoried semi-primitive acres.

**WILDERNESS/ROADLESS/NATIONAL SCENIC AREAS**

- Recommend Saint Mary's Addition West, Little River, Rich Hole Addition, Ramsey's Draft Addition, Rough Mountain Addition and Beech Lick Knob (total 27,200 acres) for Wilderness Study Areas.
- Recommend the Shenandoah Mountain National Scenic Area (67,500 acres, this acreage is exclusive of any Recommended Wilderness Study Areas within its boundaries).
- All Inventoried Roadless Areas not Recommended for Wilderness Study or Special Biological Areas are allocated to Remote Backcountry. All of the areas are managed with timber harvest and road construction restrictions that are consistent with the 2001 RACR.
- Areas in Potential Wilderness Areas (and not in Inventoried Roadless Areas) are allocated to a variety of management prescription areas including Remote Backcountry and Mosaics of Wildlife Habitat.

**TIMBER HARVEST**

- ASQ around 27.6 MMBF/year, annual regeneration program of 1,800-3,000 acres. Suitable acres are 452,000.
- Primary purpose of timber harvest is to support other resource objectives with a secondary purpose of providing wood products.

**TIMBER HARVEST, TERRESTRIAL DIVERSITY, FIRE**

- Amount and location of early successional is based on ecological objectives, and restoration needs.

**TERRESTRIAL DIVERSITY**

- One broad management area prescription for wildlife habitat emphasis.
- About 121,000 acres of Special Biological Areas.

**OLD GROWTH**

- No old growth management area prescription areas. Old growth defined by Regional definitions.
- Most of the stands with old growth forest types meeting the old growth definition are unsuitable for timber production. Areas in the common forest types (Dry-Mesic Oak Forests and Dry & Dry-Mesic Oak-Pine Forests) that are on lands suitable for timber production could be considered for harvest.
- The Peters Mountain and Frozen Head areas (boundaries modified from the Virginia Department of Conservation and Recreation proposal) are identified as Key Natural Heritage Communities and are unsuitable for timber production.

**FOREST HEALTH**

- Aggressive treatment of non-native invasive species; use of Integrated Pest Management techniques; emphasis on minimizing spread to adjacent private lands; aggressive prevention and control in disturbed areas or high use areas.

**WIND**

- Areas not suitable for wind development: Wilderness, Recommended Wilderness Study Areas, Eligible Scenic River Corridors, Eligible Recreation River Corridors, Appalachian Trail Corridor, Research Natural Area, Special Geologic Areas, Special Biological Areas, Key Natural Heritage Community Areas, Mount Pleasant National Scenic Area, Shenandoah Mountain Recommended National Scenic Area, Scenic Corridors and Viewsheds, Developed Recreation Areas, Blue Ridge Parkway Scenic Corridor, Shenandoah Mountain Crest-Cow Knob Salamander Area, Indiana Bat Protection Areas, Remote Backcountry Areas.

**OIL AND GAS**

- Approximately 461,000 acres are available for leasing: 236,000 under standard stipulations, 88,000 acres under controlled surface use stipulations and 137,000 under no surface occupancy stipulations. Approximately 128,000 acres are administratively unavailable for leasing (Recommended Wilderness Study, Recommended National Scenic Area, Laurel Fork, Indiana Bat-Primary Area, and Public Water Supply Watersheds (and the watershed upstream of the Dry River PWS) and 51,000 are legally unavailable for leasing (Wilderness and National Scenic Area). The remaining acres have low to no

potential for Marcellus shale so a leasing decision would be made later if there was expressed interest in those areas.

- Horizontal drilling (Marcellus shale development through high volume hydraulic fracturing) is allowed on certain portions of the Forest under strict conditions.

#### **ECONOMICS AND LOCAL COMMUNITY**

- Focus is on outputs of ecosystem services, but this results in some increase in timber commodity outputs.

#### **FIRE**

- Prescribed fire program between 12,000 and 20,000 acres/year.
- Allow wildfire to attain ecological objectives for biodiversity when appropriate.

#### **CLIMATE CHANGE**

- Increase activities to adapt to climate change (improve ecosystem resiliency, restore vegetation composition and structure, aggressive treatment of invasives).
- Source drinking watersheds and impaired waters are a priority for restoration.
- A factor to consider in amount of recommended wilderness areas is the desire for future flexibility.
- Actively restore chestnut, yellow pine, hemlock, spruce, riverfront hardwoods, beaver meadows, fire dependent and adapted communities, open woodlands, TESLR species.
- Timber harvest, fire and grassland/shrubland maintenance are used to manage vegetation structure and composition to improve resiliency of the ecosystems.

## Alternative I – Selected Alternative

Alternative I was developed after reviewing public comments and new information received after release of the Draft EIS. Alternative I is the same as Alternative H except for the oil and gas leasing availability component. With respect to the availability of lands for federal oil and gas leasing, Alternative I uses the approach for administrative availability of Alternative C where no areas are available for federal oil and gas leasing, except Alternative I makes the lands with existing leases available after the current leases expire. Existing leases (approximately 10,200 acres) and private mineral rights (approximately 167,200 acres) will not be affected by this decision.

This alternative provides a variety of resource benefits, including wood, wildlife, fish, range, dispersed recreation, developed recreation, minerals, wilderness and special uses, in a manner that maintains the diversity, productivity and long-term sustainability of ecosystems. It actively restores and maintains vegetative compositional and structural conditions needed to provide for a variety of terrestrial and aquatic species in certain areas of the forest. Habitats are provided for game species, species with high public interest, species with demanding habitat requirements, species that are ecological indicators and keystone species. It substantially increases the objective for using prescribed fire in ecosystem restoration and allows wildfire to achieve ecological objectives for resource enhancement when appropriate. Prescribed fire, timber harvest and maintenance of grasslands and shrublands are all used to provide a diverse mix of habitats in the ecological systems. In some areas of the forest large blocks of mature forest predominate. Restoration treatments focus on increasing structural diversity in ecological systems and on improving soil and water concerns in high priority watersheds. As a result of restoration treatments, commodities such as sawlogs, wood biomass energy, and fuelwood are available for local industry and individual needs.

Road network mileage is reduced through closure or decommissioning of roads not needed for ecosystem stewardship, restoration or dispersed recreation use. Many of the closed roads are used to supplement the trail system for non-motorized uses. All of the Inventoried Roadless Areas are managed with timber harvest and road construction restrictions that are consistent with the 2001 Roadless Area Conservation Rule (RACR).

Resource management is designed to attract recreation users, both locally and from large population centers near the forest. A variety of recreation settings and experiences, both motorized and non-motorized is provided. Large blocks of unroaded areas provide remote, backcountry experiences not available on private lands. High scenic quality is a major emphasis.

The following are highlights of Alternative I:

### ACCESS

- No net increase in open road miles.
- Road construction 1.5 miles/year.
- Decommissioning 16 miles/year. An additional 4 miles of road would be decommissioned if all Recommended Wilderness Study Areas become designated by Congress.

### WATER, SOILS, RIPARIAN, AQUATIC DIVERSITY

- Riparian Areas same as on Jefferson (100' on perennial, 50' on intermittent streams) in all watersheds.
- Priority watersheds that are identified based on sensitive aquatic species, drinking water use identified by state agencies, and impairment identified by state agencies that can be addressed by management activities on the Forest are a priority for restoration activities.

### RECREATION

- Three existing ATV/OHV Use Areas; possible expansion of existing areas to provide stacked loops based on difficulty level and single track riding opportunities; drop planned Archer Run area.
- No net increase in trail maintenance, focus on relocating or decommissioning unsustainable trails, decommissioning low use trails, adding stacked loops within existing trail systems, providing connectors between existing trails, and, if feasible, providing trailheads near population centers and/or major road routes.

- High clearance roads remain available for OHV use at current levels.
- No new developed recreation sites, few expansions at existing sites.
- Maintain most of the inventoried semi-primitive acres.

**WILDERNESS/ROADLESS/NATIONAL SCENIC AREAS**

- Recommend Saint Mary's Addition West, Little River, Rich Hole Addition, Ramsey's Draft Addition, Rough Mountain Addition and Beech Lick Knob (total 27,200 acres) for Wilderness Study Areas.
- Recommend the Shenandoah Mountain National Scenic Area (67,500 acres, this acreage is exclusive of any Recommended Wilderness Study Areas within its boundaries).
- All Inventoried Roadless Areas not Recommended for Wilderness Study or Special Biological Areas are allocated to Remote Backcountry. All of the areas are managed with timber harvest and road construction restrictions that are consistent with the 2001 RACR.
- Areas in Potential Wilderness Areas (and not in Inventoried Roadless Areas) are allocated to a variety of management prescription areas including Remote Backcountry and Mosaics of Wildlife Habitat.

**TIMBER HARVEST**

- ASQ around 27.6 MMBF/year, annual regeneration program of 1,800-3,000 acres. Suitable acres are 452,000.
- Primary purpose of timber harvest is to support other resource objectives with a secondary purpose of providing wood products.

**TIMBER HARVEST, TERRESTRIAL DIVERSITY, FIRE**

- Amount and location of early successional is based on ecological objectives, and restoration needs.

**TERRESTRIAL DIVERSITY**

- One broad management area prescription for wildlife habitat emphasis.
- About 121,000 acres of Special Biological Areas.

**OLD GROWTH**

- No old growth management area prescription areas. Old growth defined by Regional definitions.
- Most of the stands with old growth forest types meeting the old growth definition are unsuitable for timber production. Areas in the common forest types (Dry-Mesic Oak Forests and Dry & Dry-Mesic Oak-Pine Forests) that are on lands suitable for timber production could be considered for harvest.
- The Peters Mountain and Frozen Head areas (boundaries modified from the Virginia Department of Conservation and Recreation proposal) are identified as Key Natural Heritage Communities and are unsuitable for timber production.

**FOREST HEALTH**

- Aggressive treatment of non-native invasive species; use of Integrated Pest Management techniques; emphasis on minimizing spread to adjacent private lands; aggressive prevention and control in disturbed areas or high use areas.

**WIND**

- Areas not suitable for wind development: Wilderness, Recommended Wilderness Study Areas, Eligible Scenic River Corridors, Eligible Recreation River Corridors, Appalachian Trail Corridor, Research Natural Area, Special Geologic Areas, Special Biological Areas, Key Natural Heritage Community Areas, Mount Pleasant National Scenic Area, Shenandoah Mountain Recommended National Scenic Area, Scenic Corridors and Viewsheds, Developed Recreation Areas, Blue Ridge Parkway Scenic Corridor, Shenandoah Mountain Crest-Cow Knob Salamander Area, Indiana Bat Protection Areas, Remote Backcountry Areas.

**OIL AND GAS**

- The approximately 167,200 acres (or 16% of the GWNF) of mineral rights that are owned by private parties (also called outstanding or reserved mineral rights) are constitutionally protected property rights and would not be affected by implementation of this alternative.

- The approximately 10,200 acres (or 1 percent of the GWNF) of mineral rights that are under current federal oil and gas leases would not be affected by implementation of this alternative.
- The lands currently under lease will be available for leasing after the current leases expire, terminate, or are relinquished.
- The approximately 51,000 acres (or 5% of the GWNF) that are congressionally withdrawn from mineral entry (i.e. Wilderness, and Mount Pleasant Scenic Area) would continue to be legally unavailable for federal oil and gas leasing.
- All other areas would be administratively unavailable for federal oil and gas leasing.

#### ECONOMICS AND LOCAL COMMUNITY

- Focus is on outputs of ecosystem services, but this results in some increase in timber commodity outputs.

#### FIRE

- Prescribed fire program between 12,000 and 20,000 acres/year.
- Allow wildfire to attain ecological objectives for biodiversity when appropriate.

#### CLIMATE CHANGE

- Increase activities to adapt to climate change (improve ecosystem resiliency, restore vegetation composition and structure, aggressive treatment of invasives).
- Source drinking watersheds and impaired waters are a priority for restoration.
- A factor to consider in amount of recommended wilderness areas is the desire for future flexibility.
- Actively restore chestnut, yellow pine, hemlock, spruce, riverfront hardwoods, beaver meadows, fire dependent and adapted communities, open woodlands, TESLR species.
- Timber harvest, fire and grassland/shrubland maintenance are used to manage vegetation structure and composition to improve resiliency of the ecosystems.

**NOTE ON ALL ALTERNATIVES:** Management activities in Inventoried Roadless Areas (IRAs) are conditional on the 2001 Roadless Area Conservation Rule (RACR). During the development of the issues and alternatives in this EIS, the 2001 RACR was under litigation and subject to changes in policy. Currently the 2001 RACR is in effect and applies to all IRAs. While Forest Plan management direction would allow timber harvest and road construction in some IRAs under Alternatives A, B, D and E, the 2001 RACR would not allow such activities to be implemented. Forest Plan direction under Alternatives C, F, G, H and I would be the same as the 2001 RACR for all of the IRAs.



## COMPARISON OF ALTERNATIVES

Table 2-2 displays the allocation of management prescriptions by alternative. It is important to note that the same area of land could be allocated to several Management Prescriptions, such as a Special Biological Area that occurs within a Designated Wilderness or the Appalachian National Scenic Trail Corridor that passes through a Designated Wilderness. The management prescription that has the most stringent management requirements is the one mapped to the area in Table 2-2.

The remainder of this section compares how each alternative addresses the significant issues. This comparison provides a brief summary of Chapter 3 (Environmental Effects of Alternatives) of this Environmental Impact Statement. Alternatives H and I are identical for all issues, with the exception of lands available for oil and gas leasing. For this issue, Alternative I is the same as Alternative C.

Table 2-2. Land Allocation of Management Prescriptions by Alternative, as mapped hierarchically

RX	RX DESCRIPTION	ALT A		ALT B		ALT C		ALT D	
		Acres	%	Acres	%	Acres	%	Acres	%
1A	Designated Wilderness	43,000	4%	43,000	4%	43,000	4%	43,000	4%
1B	Recommended Wilderness Study Areas	1,000	<1%	20,000	2%	387,000	36%	15,000	1%
2C2	Eligible Wild and Scenic River-Scenic	4,000	<1%	3,000	<1%	4,000	<1%	4,000	<1%
2C3	Eligible Wild and Scenic River-Recreation	4,000	<1%	3,000	<1%	4,000	<1%	4,000	<1%
4A	Appalachian Trail Corridor	9,000	1%	9,000	1%	7,000	1%	9,000	1%
4B1	Research Natural Areas	3,000	<1%	2,000	<1%	2,000	<1%	2,000	<1%
4C1	Geologic Areas	0	0%	0	0%	0	0%	0	0%
4D	Special Biological Areas	24,000	2%	51,000	5%	21,000	2%	52,000	5%
4D1	Key Natural Heritage Community Areas								
4E	Cultural Areas		<1%		<1%		<1%		<1%
4F	Mount Pleasant National Scenic Area	8,000	1%	8,000	1%	8,000	1%	8,000	1%
4FA	Recommended National Scenic Areas							8,000	1%
5A	Administrative Sites		<1%		<1%		<1%		<1%
5B	Communication Sites		<1%		<1%		<1%		<1%
5C	Utility Corridors	7,000	1%	7,000	1%	7,000	1%	7,000	1%
7A1	Scenic Byways	5,000	<1%	5,000	<1%	5,000	<1%	5,000	<1%
7B	Scenic Corridors/Viewsheds	44,000	4%	38,000	4%	1,000	<1%	35,000	3%
7C	ATV Use Areas	11,000	1%	10,000	1%	10,000	1%	10,000	1%
7D	Recreation Areas					1,000	<1%	1,000	<1%
7E	Dispersed Recreation Areas								
7E1	Dispersed Recreation Areas-Unsuitable for Timber	39,000	4%	28,000	3%	22,000	2%	21,000	2%
7E2	Dispersed Recreation Areas-Suitable for Timber	5,000	<1%	4,000	<1%			5,000	<1%
7F	Blue Ridge Parkway Corridor			4,000	<1%	4,000	<1%	4,000	<1%
7G	Pastoral Landscapes	6,000	1%	4,000	<1%			4,000	<1%
8A1	Mix of Successional Habitats	258,000	24%					317,000	30%
8A1U	Mix of Successional Habitats-Unsuitable	70,000	7%						
8B	Early Successional Habitats	39,000	4%					34,000	3%
8BU	Early Successional Habitats-Unsuitable	1,000	<1%						
8C	Black Bear/Remote Habitats	74,000	7%					125,000	12%
8CU	Black Bear/Remote Habitats-Unsuitable	61,000	6%						
8E4a	Indiana Bat-Primary Areas	2,000	<1%	2,000	<1%	2,000	<1%	2,000	<1%
8E4b	Indiana Bat-Secondary Area	11,000	1%	14,000	1%	14,000	1%	14,000	1%
8E7	Shen Mtn Crest-Cow Knob Salamander Area	43,000	4%	47,000	4%	20,000	2%	54,000	5%
9A1	Source Water Watershed Protection					143,000	13%		
10B	Timber Production Area	87,000	8%					91,000	9%
10BU	Timber Production-Unsuit	5,000	<1%						
11	Riparian Areas	51,000 acres which are embedded within other prescription areas							
12D	Remote Backcountry	199,000	19%	192,000	18%	114,000	11%	190,000	18%
13	Mosaics of Habitat-Suitable			569,000	53%				
13U	Mosaics of Habitat-Unsuitable					246,000	23%		
Water	Lake Moomaw	2,500	<1%	2,500	<1%	2,500	<1%	2,500	<1%
Total		1,066,000		1,066,000		1,066,000		1,066,000	

Table 2-2. Land Allocation of Management Prescriptions by Alternative (Cont'd)

RX	RX DESCRIPTION	ALT E		ALT F		ALT G		ALTS H and I	
		Acres	%	Acres	%	Acres	%	Acres	%
1A	Designated Wilderness	43,000	4%	43,000	4%	43,000	4%	43,000	4%
1B	Recommended Wilderness Study Areas	24,000	2%	113,000	11%	20,000	2%	27,000	3%
2C2	Eligible Wild and Scenic River-Scenic	4,000	<1%	2,000	<1%	4,000	<1%	2,000	<1%
2C3	Eligible Wild and Scenic River-Recreation	4,000	<1%	4,000	<1%	4,000	<1%	4,000	<1%
4A	Appalachian Trail Corridor	9,000	1%	9,000	1%	9,000	1%	9,000	1%
4B1	Research Natural Areas	2,000	<1%	2,000	<1%	2,000	<1%	2,000	<1%
4C1	Geologic Areas	4,000	<1%	0	<1%	4,000	<1%	3,000	<1%
4D	Special Biological Areas	52,000	5%	30,000	3%	51,000	5%	53,000	5%
4D1	Key Natural Heritage Community Areas					3,000	<1%	3,000	<1%
4E	Cultural Areas		<1%		<1%		<1%		<1%
4F	Mount Pleasant National Scenic Area	8,000	1%	8,000	1%	8,000	1%	8,000	1%
4FA	Recommended National Scenic Areas			128,000	12%			67,000	6%
5A	Administrative Sites		<1%		<1%		<1%		<1%
5B	Communication Sites		<1%		<1%		<1%		<1%
5C	Utility Corridors	7,000	1%	7,000	1%	7,000	1%	7,000	1%
7A1	Scenic Byways	5,000	<1%	5,000	<1%	5,000	<1%	5,000	<1%
7B	Scenic Corridors/Viewsheds	34,000	3%	32,000	3%	35,000	3%	34,000	3%
7C	ATV Use Areas	10,000	1%	10,000	1%	10,000	1%	10,000	1%
7D	Recreation Areas	1,000	<1%	1,000	<1%	1,000	<1%	1,000	<1%
7E	Dispersed Recreation Areas								
7E1	Dispersed Recreation Areas-Unsuitable for Tbr	21,000	2%	15,000	1%	24,000	2%	24,000	2%
7E2	Dispersed Recreation Areas-Suitable for Timber	4,000	<1%	1,000	<1%	4,000	<1%	4,000	<1%
7F	Blue Ridge Parkway Corridor	4,000	<1%	4,000	<1%	4,000	<1%	4,000	<1%
7G	Pastoral Landscapes	4,000	<1%	4,000	<1%	4,000	<1%	4,000	<1%
8A1	Mix of Successional Habitats								
8A1U	Mix of Successional Habitats-Unsuitable								
8B	Early Successional Habitats								
8BU	Early Successional Habitats-Unsuitable								
8C	Black Bear/Remote Habitats								
8CU	Black Bear/Remote Habitats-Unsuitable								
8E4a	Indiana Bat-Primary Areas	2,000	<1%	2,000	<1%	2,000	<1%	2,000	<1%
8E4b	Indiana Bat-Secondary Area	14,000	1%	14,000	1%	14,000	1%	14,000	1%
8E7	Shen Mtn Crest-Cow Knob Salamander Area	50,000	5%	23,000	2%	47,000	4%	24,000	2%
9A1	Source Water Watershed Protection								
10B	Timber Production								
10BU	Timber Production-Unsuit								
11	Riparian Areas	51,000 acres which are embedded within other prescription areas							
12D	Remote Backcountry	264,000	25%	148,000	14%	251,000	24%	201,000	19%
13	Mosaics of Habitat-Suitable	491,000	46%	350,000	33%	508,000	48%	508,000	48%
13U	Mosaics of Habitat-Unsuit	3,000	<1%	109,000	10%				
Water	Lake Moomaw	2,500	<1%	2,500	<1%	2,500	<1%	2,500	<1%
Total		1,066,000		1,066,000		1,066,000		1,066,000	

## Access

**ISSUE STATEMENT:** Forest management strategies may affect the balance between public and management needs for motorized access to Forest lands (for recreation, hunting, management activities, fire suppression) and protection of soil and water resources, wildlife populations and habitat, aesthetics, forest health, and desired vegetation conditions.

Although the road system of the GWNF is largely complete, there are still occasional needs for new roads to access trailheads, manage vegetation, or facilitate mineral development. Table 2-3 displays the estimated road construction miles, road decommissioning miles and the total roads system by the different alternatives, at the end of the first ten years.

Table 2-3. Comparison of the Access Issue by Alternative (miles)

Issue	Alt A	Alt A <sup>1</sup>	Alt B	Alt C	Alt D	Alt E	Alt F	Alt G	Alts H and I
Current Roads	1,805	1,805	1,805	1,805	1,805	1,805	1,805	1,805	1,805
Special Use Roads	50	50	50	50	50	50	50	50	50
Potential Forest Highways	129	129	129	129	129	129	129	129	129
Roads to be Decommissioned	N/A	N/A	160	160	80	160	160	160	160
Potential Additional Decommissioning from future wilderness designation	0	0	2	147	6	4	26	2	4
Road Construction	29	18	15	0	41	9	5	15	15
Total Forest Road System at end of 10 years*	1,655	1,644	1,479	1,319	1,581	1,471	1,445	1,479	1,477

A<sup>1</sup> represents the actual implementation level of the 1993 Revised GWNF Plan

\*Special Use Roads and Potential Forest Highways are not included in the Total Forest Road System estimates

## Watersheds, Soil and Water Quality, Riparian Resources and Aquatic Diversity

**ISSUE STATEMENT:** Management activities may affect soil quality, water quality (surface and groundwater) and riparian resources, including drinking water watersheds and those watersheds with streams impaired due to activities off the Forest. Management activities may affect the maintenance and restoration of aquatic biodiversity and may affect species with potential viability concerns.

Table 2-4 highlights several factors associated with this issue. In project implementation, the application of standards for the riparian management prescription and channeled ephemeral stream standards should fully protect drinking water quality. No measureable direct or indirect effects on water quality should occur. In order to verify that these standards are adequate, some ground disturbing projects will be monitored for implementation of standards and for effectiveness of standards. All of the alternatives protect the floodplain/riparian ecological system, but Alternatives B, C, E, F, G, H and I expand the width of the riparian corridor in all watersheds and so increase the area that will receive the riparian management objectives, desired conditions and objectives to protect, restore and maintain riparian resources. Alternative D expands the width of the riparian corridor only within the watersheds containing aquatic threatened and endangered species.

Table 2-4. Comparison of the Watersheds, Soil and Water Quality, Riparian Resources, Aquatic Diversity Issue by Alternative

Issue	Alt A	Alt A <sup>1</sup>	Alt B	Alt C	Alt D	Alt E	Alt F	Alt G	Alts H and I
Soil and Water, acres per year									
Areas of ground disturbance	182	72	178-262	66	276-413	175-254	138-200	183-267	183-267
Riparian Areas, feet									
Riparian corridor width-perennial streams	66+	66+	100	100, larger in source watersheds and by impaired streams	100 in aquatic T&E species watersheds, 66'+ in other watersheds	100	100	100	100
Riparian corridor width-intermittent streams	33'+	33+	50	50, larger in source watersheds and by impaired streams	50 in aquatic T&E species watersheds, 33'+ in other watersheds	50	50	50	50
Riparian corridor width-ephemeral streams	N/A	N/A	25	25	N/A	25	25	25	25

A<sup>1</sup> represents the actual implementation level of the 1993 Revised GWNF Plan

## Terrestrial Biological Diversity

**ISSUE STATEMENT:** Forest Plan management strategies may affect the maintenance and restoration of the diverse mix of terrestrial plant and animal habitat conditions and may affect species with potential viability concerns.

Ecological communities provide the foundation for biological diversity. Ecosystems identified on the Forest include ecological communities that predominate on the landscape (e.g. Central Appalachian Dry Oak-Pine Forest); communities that are declining, rare, or unique (e.g. Caves and Karstlands); and communities that provide habitat for species with potential viability concerns (e.g. Special Biological Areas). By restoring and maintaining the key characteristics, conditions, and functionality of native ecological systems, the GWNF should be able to maintain and improve ecosystem diversity and also provide for the needs of diverse plant and animal species on the forest. Although there are 24 ecological systems on the Forest, for most purposes they can be combined in the following nine ecological system groups: Oak Forests and Woodlands; Pine Forests and Woodlands; Northern Hardwood Forests; Spruce Fir Forests; Cove Forests; Cliff, Talus and Shale Barrens; Mafic Glade and Barrens and Alkaline Glades and Woodlands; Caves and Karstlands; and Floodplains, Wetlands, and Riparian Areas.

Structure and tree age diversity are both characteristics that are important to all forested ecological systems. Table 2-5 compares the structural diversity provided in the alternatives. The early successional forest habitat component includes timber regeneration harvest and natural disturbances, except for Alternative C which has no timber harvest. The active management actions contributing to the changes in habitat components include timber harvest, prescribed fire and wildlife habitat improvements.

Table 2-5. Projected Habitat Components at 10 Years by Alternative

Habitat Component	Current Condition	Alt A	Alt A <sup>1</sup>	Alt B	Alt C	Alt D	Alt E	Alt F	Alt G	Alts H and I
Early Successional Forest	3%	4%	2%	3-4%	2%	4-6%	3-4%	3%	3-4%	3-4%
Open Woodlands	4%	5%	7%	8-11%	2%	6-8%	11%	8-11%	8-11%	8-11%
Grassland/Shrublands	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%
Mid- to Late Successional Hard Mast Producing Forest	89%	88%	90%	87%	90%	86%	88%	89%	87%	87%
Total Acres Active Management	4%	6%	6%	8-12%	<1%	8-11%	12%	8-11%	8-12%	8-12%

A<sup>1</sup> represents the actual implementation level of the 1993 Revised GWNF Plan

## Old Growth

**ISSUE STATEMENT:** Forest management strategies may affect the potential biological and social values associated with the abundance, distribution and management of existing and future old growth.

Old growth provides both biological and social values. Old growth communities provide large den trees for wildlife species such as black bear, large snags for birds and cavity nesters, and large cover logs for other wildlife. Ecologically, old growth provides elements for biologic richness, gene conservation, and riparian area enhancement. Old growth areas provide for certain recreational experiences, research opportunities, and educational study. Other areas have associated historical, cultural, and spiritual values.

There are a variety of viewpoints about old growth forests on public lands. Some viewpoints state the spatial distribution and linkages of patches with varying sizes are important, that old growth communities are underrepresented on private lands, and that the national forests have the best opportunity to provide for these communities. There is also a debate about how old growth should be managed, maintained, or restored. Many people state that old growth areas should be protected or “preserved” and that there should be no harvesting within these areas.

On the other hand, old growth areas are a source of large-diameter, high-value hardwoods, which are limited in supply and in high demand for such products as furniture and finish construction work. Others say that insect and disease risk can be relatively high in old growth stands and could (for some community types) threaten the retention of those stands as old growth. There is concern that fire exclusion could favor a buildup of fire-intolerant, but shade-tolerant, species that could eventually replace the original old growth type.

In Alternatives C, E, and F all stands meeting the definition of existing old growth are unsuitable for timber production. In Alternatives A and B existing old growth in the Dry-Mesic Oak Old Growth Forest Type (OGFT 21) on suitable ground remain suitable for timber production. In Alternatives D, G, H and I old growth in both the Dry-Mesic Oak (OGFT 21) and Dry and Dry-Mesic Oak-Pine (OGFT 25) stands on suitable ground remain suitable for timber production. Since we do not have an inventory of acres that meet the definition of old growth, Table 2-6 displays the estimated level of old growth based solely on stand age. Alternatives C, E and F contain the greatest acreage of estimated old growth ineligible for timber harvest. This is followed by Alternatives A, G, H and I. Alternatives B and D allows for the most potential harvest of old growth.

Table 2-6. Percent of Estimated Old Growth Ineligible for Timber Harvest

OGF Type #	Old Growth Forest Type Name	Estimated Acres of Old Growth	Alt A	Alt B	Alt C	Alt D	Alt E	Alt F	Alt G	Alts H and I
1	Northern Hardwood Forest	1,263	100%	100%	100%	100%	100%	100%	100%	100%
2a	Hemlock-Northern Hardwood	2,494	100%	100%	100%	100%	100%	100%	100%	100%
2b	White Pine-Northern Hardwood	688	100%	100%	100%	100%	100%	100%	100%	100%
2c	Red Spruce-Northern Hardwood	118	100%	100%	100%	100%	100%	100%	100%	100%
5	Mixed Mesophytic Forest	5,064	100%	100%	100%	100%	100%	100%	100%	100%
21	Dry- Mesic Oak	151,371	58%	46%	100%	46%	100%	100%	54%	54%
22	Dry and Xeric Oak	331	100%	100%	100%	100%	100%	100%	100%	100%
24	Xeric Pine and Pine Oak	66,468	100%	100%	100%	100%	100%	100%	100%	100%
25	Dry and Dry Mesic Oak-Pine	16,850	100%	100%	100%	48%	100%	100%	55%	56%
28	Eastern Riverfront Forest	6	100%	100%	100%	100%	100%	100%	100%	100%
Total Acreage		244,653								

## Forest Health

**ISSUE STATEMENT:** Forest Plan management strategies may affect the spread and control of non-native invasive species, forest pests, and pathogens, all of which have the potential to affect long-term sustainability, resiliency, and composition of forest ecosystems.

While not all non-native species are known to disrupt native ecosystems, of particular concern are those that are successful at invading and rapidly spreading through natural habitats. Invasive plants create a host of harmful environmental effects to native ecosystems including: displacement of native plants; degradation or elimination of habitat and forage for wildlife; extirpating rare species; impacting recreation; affecting fire frequency; altering soil properties; and decreasing native biodiversity. Invasive plants spread across landscapes, unimpeded by ownership boundaries. Even without active management NNIP infestations will occur across the Forest. Insect and disease outbreaks, wildfires, storm events (including wind thrown trees, flooding, landslides, and ice damage) encourage NNIP establishment. Alternative A follows the current Plan which is not as aggressive in controlling NNIP as Alternatives D, E, F, G, H and I. Alternative B only includes integrated pest management and is less aggressive at controlling NNIP than D, E, F, G, H and I. Alternative C would result in the least amount of ground disturbance which could reduce the potential for NNIP infestations; however, the decrease in accessibility in Alternative C could result in less aggressive treatment of NNIP infestations. Alternatives D, E, F, G, H and I all have similar language regarding pre-treatment and post-treatment of areas that will be disturbed. Therefore, the potential for NNIP infestations from ground disturbing activities could be offset by aggressive NNIP treatments.

The GWNF has experienced gypsy moth defoliation since 1987, through 3 to 4 outbreak cycles with a total of about 1.5 million acres defoliated (some acres defoliated in multiple years). Many areas have been defoliated several times, resulting in severe mortality. Although the front of the gypsy moth infestation has passed the forest, the gypsy moth will likely be a part of the Forest's ecosystem for many years to come. Approximately 867,000 acres of the GWNF is comprised of forest types susceptible to gypsy moth infestation (types where

oak either dominates or is a significant portion of the stand). This represents approximately 81% of the forest in a moderate or severely susceptible host type. While suppression of gypsy moth populations would be permissible under all alternatives, the economic cost and concern for environmental impacts of widespread use of current treatment tactics, primarily the aerial application of insecticides, would result in only a very small amount of the Forest receiving such management actions. Timber harvest and prescribed fire can help reduce gypsy moth risk in upland oak and mixed oak-pine stands. Table 2-7 shows how the alternatives vary in their effect on gypsy moth risk at the end of 50 years of management. Alternative D would have the highest potential to reduce gypsy moth impacts with approximately 45% of the GWNF in a high or extreme gypsy moth risk. Similar conclusions can be made about the effects on oak decline since oak species are the most susceptible to gypsy moth.

Table 2-7. Gypsy Moth Risk at the End of 50 Years of Plan Implementation

Activity in Susceptible Forest Types	Alt A	Alt A <sup>1</sup>	Alt B	Alt C	Alt D	Alt E	Alt F	Alt G	Alts H and I
Acres Regenerated (1 <sup>st</sup> decade)	17,000	5,000	11,000	0	23,000	11,000	8,000	11,000	11,000
Acres Thinned (1 <sup>st</sup> decade)	6,000	4,000	4,000	0	8,000	4,000	2,000	4,000	4,000
Total Acres Harvested (1 <sup>st</sup> decade)	23,000	15,000	15,000	0	31,000	15,000	10,000	15,000	15,000
% Acres at High Risk (1 <sup>st</sup> decade)	37%	38%	38%	38%	37%	38%	38%	38%	38%
% Acres at High Risk (5 <sup>th</sup> decade)	34%	39%	37%	39%	32%	36%	38%	36%	36%
% Acres at Extreme Risk (1 <sup>st</sup> decade)	19%	20%	20%	20%	19%	20%	20%	20%	20%
% Acres at Extreme Risk (5 <sup>th</sup> decade)	15%	20%	19%	21%	13%	17%	19%	17%	17%

A<sup>1</sup> represents the actual implementation level of the 1993 Revised GWNF Plan

Unfortunately, most of the hemlocks on the Forest have succumbed to the hemlock woolly adelgid. In some areas, white pine may be able to fill this ecological niche, but it will take time for white pine to fully occupy the sites formerly held by hemlock. Loss of cover is likely to also adversely affect a myriad of bird and wildlife species on the GWNF. Therefore, the difference in the effects on riparian habitat from other management activities between the alternatives is the best way to look at the effects from the hemlock woolly adelgid.

Southern pine beetle (SPB) is a native pest whose infestations have occurred cyclically throughout recorded history in the South. Managers can control both the proportion of susceptible species and the radial growth of trees through vegetation manipulation activities. Thinning and/or regeneration harvests can alter both species composition and radial growth of the trees within a stand. However, thinning in these stands that often occur on relatively poor sites is rarely economically, or even logistically, viable. Many of these stands occur on lands unsuitable for timber production. The use of prescribed fire can reduce stand density, similar to a thinning, and ultimately increase radial growth on the residual stems, thus decreasing susceptibility. Fire can also regenerate some forest types, especially table mountain pine and to a lesser extent pitch pine. Thus, while timber harvest can help to lower SPB risk, the use of prescribed fire can treat the most acres and represents the best tool in lowering SPB risk. Table 2-8 shows how the risk to Southern Pine Beetle varies among the alternatives.



Table 2-8. Acres in Southern Appalachian Montane Pine Forest and Woodland and Central Appalachian Pine-Oak Rocky Woodland Ecological Systems Burned, Regenerated, and Thinned and at Risk from Southern Pine Beetle Effects at the End of the Next Decade by Alternative

Activity in Susceptible Forest Types	Alt A	Alt A <sup>1</sup>	Alt B	Alt C	Alt D	Alt E	Alt F	Alt G	Alts H and I
Acres Managed by Fire	3,000	7,400	16,000	10,000	12,000	70,000	16,000	70,000	70,000
Acres Regenerated by Harvest	2,000	300	700	0	3,000	1,500	1,000	1,500	1,500
Acres Thinned by Harvest	0	0	0	0	0	200	0	200	200
Total Acres Vulnerable/High Risk	114,000	111,000	102,000	109,000	104,000	48,000	102,000	48,000	48,000

A<sup>1</sup> represents the actual implementation level of the 1993 Revised GWNF Plan

## Wind Energy

**ISSUE STATEMENT:** Responding to opportunities to develop wind energy generation may result in effects on a wide variety of resources (including birds, bats, scenery, trail use, soils on ridgetops, water, noise, remote habitat, local communities/economies, and social values).

Alternative A, the current Forest Plan, does not address this issue. No areas are considered to be unsuitable for wind energy development (except for wilderness and recommended wilderness), though management area guidance would limit road construction and clearing activities in some areas. Alternatives B, F, G, H and I would allow consideration of wind energy development proposals on some areas of the Forest but the following areas are unsuitable for wind energy development: Wilderness, Recommended Wilderness Study Areas, Eligible Scenic River Corridors, Eligible Recreation River Corridors, Appalachian Trail Corridor, Research Natural Areas, Geologic Areas, Special Biological Areas, Key Natural Heritage Community Areas, Mount Pleasant National Scenic Area, Shenandoah Mountain Recommended National Scenic Area (Alternatives H and I), Scenic Corridors and Viewsheds (only in Alternatives H and I), Developed Recreation Areas, Blue Ridge Parkway Scenic Corridor, Shenandoah Mountain Crest–Cow Knob Salamander Area, Indiana Bat Protection Areas, and Remote Backcountry Areas. Alternative D is similar to Alternatives B, F, G, H and I except that wind energy development proposals would be considered in several Remote Backcountry Areas because of the high potential for wind energy development. Alternatives C and E prohibit the development of wind energy across the Forest.

A total of about 117,000 acres of land on the GWNF has been identified as having fair (Class 3) to outstanding (Class 6) wind power potential. Table 2-9 displays the amount of land identified as Class 3 or above that would be unsuitable for wind energy development under each alternative.

Table 2-9. Land in Wind Class 3 or Greater that is Unsuitable for Wind Energy Development (acres)

Issue	Alt A	Alt B	Alt C	Alt D	Alt E	Alt F	Alt G	Alts H and I
Total Acres with Wind Energy Potential	117,000	117,000	117,000	117,000	117,000	117,000	117,000	117,000
Total Unsuitable for Wind Energy Development	8,000	70,000	117,000	53,000	117,000	76,000	78,000	82,000

Alternative C and E would have no wind energy development. They would not address the need for alternative energy sources.

## Oil and Gas Leasing

**ISSUE STATEMENT:** Use of National Forest System lands to support energy needs through federal oil and gas leasing may affect forest resources and impact adjacent private lands.

The alternatives respond to the oil and gas issue by varying the amount of acres available for leasing as well as the lease available constraints (Stipulations). Each Management Prescription Area in the Forest Plan identifies if the area is suitable for leasing; and if it is suitable, what surface occupancy stipulation applies. However, in some alternatives (E and H) only portions of the Management Prescription Area are actually made available. In Alternative E, public water supply watersheds are unavailable regardless of which Management Prescription Area they are located. In Alternative H, public water supply watersheds (including the watershed upstream of the Dry River PWS) are unavailable and the area on Shenandoah Mountain south of Highway 250 and above 3,000 feet in elevation is available only with No Surface Occupancy.

In addition, Alternative H makes no decision on the availability of lands on the Lee and Pedlar Ranger Districts, on Walker Mountain on the North River Ranger District, and on Back Creek Mountain and Warm Springs Mountain on the Warm Springs Ranger District. The Reasonably Foreseeable Development Scenario identifies the Marcellus shale as the formation with a high potential for gas and the Marcellus formation is not well represented in these areas. Alternative H emphasizes the development of the Marcellus and withholds a decision on areas with unknown potential.

As a further response to Marcellus Shale concerns, additional stipulations were developed and applied to several of the alternatives. A Horizontal Drilling Moratorium Stipulation and a Horizontal Drilling Operations Control would apply to all Management Prescription Areas where leasing is administratively available in Alternatives B, D, and F. A No Horizontal Drilling Stipulation prohibiting horizontal drilling would apply to: 1) Management Prescription Areas where leasing is administratively available in Alternatives E and G; and 2) public water supply areas in Management Prescription Areas where leasing is administratively available in Alternative F.

The first five rows of Table 2-10 display the number of acres that could be federally leased under four different surface occupancy leasing options (standard terms, controlled, timing, and no surface) for each alternative. The determination of the type of surface occupancy leasing option depends on the management prescription. For example, leasing is allowed in a Scenic Corridor and Viewshed Area but only with a no surface occupancy stipulation. The two rows under the 'Total Forest Acres' address horizontal drilling and hydraulic fracturing concerns by applying additional stipulations. Alternatives E and G do not allow any horizontal drilling. Alternative F allows horizontal drilling, but not in public water supply areas. Alternative A allows horizontal drilling with no additional stipulations. Alternatives B and D allow horizontal drilling, with the Moratorium Stipulation and the Operations Control Stipulation. Alternative H allows horizontal drilling but has more restrictive surface occupancy stipulations than the other alternatives; for example, portions of Management Prescription Area 13-Mosaics of Habitat that are in semi-primitive motorized and semi-primitive non-motorized settings have a controlled surface use occupancy stipulation that does not permit road construction. Similar to Alternative C, Alternative I would not make any federal lands available for oil and gas leasing except those currently under lease. Under Alternative I those acres currently under lease would remain available for leasing after the current leases expire, are terminated, or are relinquished.

Table 2-10. Federal Oil and Gas Leasing Availability for Leases by Alternative (thousands of acres)

Issue	Alt A	Alt B	Alts C and I	Alt D	Alt E	Alt F	Alt G	Alt H
<b>Administratively Available</b>	995	983	0	981	980	763	983	461
Standard Lease Terms	139	615	0	609	535	495	550	236
Controlled Surface Use Stipulation	815	152	0	157	160	105	161	88
Timing Stipulation	0	14	0	14	14	14	14	0
No Surface Occupancy Stipulation	41	202	0	201	271	149	259	137
<b>Administratively Unavailable</b>	10	22	1,005	25	26	242	22	128
<b>Legally Unavailable</b>	51	51	51	51	51	51	51	51
<b>Administratively Available Decision Deferred*</b>	0	0	0	0	0	0	0	416
<b>Available, Under Existing Lease</b>	10	10	10	10	10	10	10	10
<b>Total Forest Acres</b>	1,066	1,066	1,066	1,066	1,066	1,066	1,066	1,066
<b>Additional Control Measures on Drilling Operations</b>	0	983	0	981	0	731	0	461
Horizontal Drilling Moratorium	0	983	0	981	0	731	0	0
No Horizontal Drilling Stipulation	0	0	0	0	980	32	983	0

\*Administratively available decision deferred on Pedlar and Lee Ranger Districts and portions of the Warm Springs and North River Ranger Districts.

To determine the effects of federal oil and gas leasing activity in the future, the Bureau of Land Management (BLM) projected post-leasing activity with a Reasonable Foreseeable Development Scenario (RFD) that estimated that a maximum of 319 natural gas wells, with associated surface disturbance, including well pads, roads, and pipelines, could occur over a 15 year planning horizon on the Forest. This projection of future oil and gas activity was based on the assumption that all the Forest except areas withdrawn from leasing by law would be available for oil and gas leasing under standard lease terms and conditions. Because each alternative will have more restrictive constraints on availability of federal oil and gas leasing by applying different stipulations, each alternative will project less oil and gas activity than the GWNF baseline RFD (as shown in Table 2-11).

Table 2-11. Federal Oil &amp; Gas Lease Activity by Alternative

Altern- ative	Type of Well	Number of wells	Roads (miles)	Pipelines (miles)	Water use for drilling (1,000s of gallons)	Water use for hydraulic fracturing (1,000s of gallons)
Alt A	Vertical wells	39	39	43	787	15,731
	Horizontal wells	198	132	145	19,767	988,350
Alt B	Vertical wells	30	30	33	609	12,177
	Horizontal wells	153	51	56	15,267	763,350
Alts C and I	Vertical wells	0	0	0	0	0
	Horizontal wells	0	0	0	0	0
Alt D	Vertical wells	30	30	33	608	12,158
	Horizontal wells	153	51	56	15,267	763,350
Alt E	Vertical wells	27	13	15	534	10,676
	Horizontal wells	0	0	0	0	0
Alt F	Vertical wells	22	11	12	436	8,722
	Horizontal wells	114	19	21	11,367	568,350
Alt G	Vertical wells	27	14	15	550	10,992
	Horizontal wells	0	0	0	0	0
Alt H	Vertical wells	19	10	10	381	7,611
	Horizontal wells	96	16	18	9,567	478,350

## Fire

**ISSUE STATEMENT:** The management of fire to achieve goals related to protection of property, wildlife habitat, ecosystem diversity and fuels management may affect air quality, non-native invasive species, recreation, water quality, wildlife, and silviculture.

Table 2-12 displays the acres of prescribed fire by alternative in an average year over the next decade.

Table 2-12. Prescribed Burning by Alternative per Year

Acres Prescribed Burned Annually	Alt A	Alt A <sup>1</sup>	Alt B	Alt C	Alt D	Alt E	Alt F	Alt G	Alts H and I
	3,000	7,400	12,000- 20,000	Limited	5,000- 12,000	20,000	12,000- 20,000	12,000- 20,000	12,000- 20,000

A<sup>1</sup> represents the actual implementation level of the 1993 Revised GWNF Plan

Alternative E would be the largest prescribed burn program since it is the restoration alternative and biologically driven. Alternative C would generate the smallest prescribed burn program as prescribed burning would be limited to managing threatened, endangered and sensitive species habitats. Alternative A has the acres estimated to be prescribed burned annually in the current Plan. Alternative D has an emphasis on commodity production and opportunities for prescribed burning would be limited. Alternatives B, F, G, H and I have a program that includes an emphasis on restoration while taking into account fluctuations in weather and funding that may limit the number of acres likely to be burned annually.

## Recreation

**ISSUE STATEMENT:** Forest management strategies should determine an appropriate mix of sustainable recreational opportunities (including trail access) that responds to increasing and changing demands and also provides for public health and safety and ecosystem protection (such as soil and water resources, nesting animals, riparian resources and spread of non-native invasive species).

Local and regional visitors use the forest for a variety of recreational opportunities, from primitive hiking and camping to developed recreation sites and motorized travel. Developed recreation is not a significant issue and it does not vary significantly by alternative. Demand for long-distance trails for special recreation events, such as long-distance mountain bicycling, equestrian endurance rides and runner marathons, has increased in recent years. The demand is greatest among the equestrian and mountain biking communities. There is more demand than supply for motorized trail opportunities. Some comments stated that OHV/ATV use is not appropriate at all on the Forest due to the noise, potential environmental damage, and the need could be met commercially on private lands. Table 2-13 highlights some of the differences between alternatives for dispersed recreation opportunities.

Table 2-13. Comparison of the Recreation Issue by Alternative

Type of Recreation Activity	Alt A	Alt B	Alt C	Alt D	Alt E	Alt F	Alt G	Alts H and I
Hiking, Pack-and-Saddle, Mountain Bicycling*	Increase 0-3%; <30 miles	No net change	Increase <3%; <30 miles	Increase 5-10%; 50-100 miles	No net change	Increase <3%; <30 miles	Increase <3%; <30 miles	Increase <3%; <30 miles
Effect of Wilderness Designation on Mountain Bicycling**	No change	Loss of 9 miles of trail	Loss of 434 miles of trail	Loss of 1 mile of trail	Loss of 11 miles of trail	Loss of 70 miles of trail	Loss of 9 miles of trail	Loss of 9 miles of trail
All-Terrain Vehicles and Motorcycles	Increase 10-25%; or 6-16 miles	No change	No change	Increase 25-60%; or 16-40 miles	No change	Increase up to 10%; or 6 miles.	Increase 5-10%; or 3-6 miles	Increase 5-10%; or 3-6 miles
Off-Highway Vehicles	Increase 0-25 miles; roads are featured for OHVs.	No featured OHV roads; current level of high clearance roads	No roads managed for OHVs	Increase 20-40 miles; roads are featured for OHVs	No roads managed for OHVs	No featured OHV roads; current level of high clearance roads	No featured OHV roads; current level of high clearance roads	No featured OHV roads; current level of high clearance roads

\* Figures used are estimates for analysis and are not intended to place a limit on net miles of new trail added to the system. The actual increase is based on no net increase in trail maintenance. Projects that decommission low use or unsustainable trails and relocate existing trails to more sustainable locations will decrease the maintenance of existing trails. This opens the door for development of new trails.

\*\* The allocation of land to Recommended Wilderness Study will not affect mountain bike use in those areas. However, if Recommended Wilderness Areas are designated as Wilderness by Congress, then all mechanical and motorized transport forms of recreation, such as mountain bicycling, will be prohibited according to the Wilderness Act of 1964.

The alternative with the most emphasis on expanding the existing overall trails program is Alternative D. It provides the greatest increases in the dispersed recreation trail systems, including hiking, mountain biking, horseback riding, ATV, OHV and interpretive trails. Alternative A increases trail construction of both motorized and non-motorized trails and identifies featured OHV roads. Alternatives B and E include no significant increase or decrease in the current motorized or non-motorized miles of trail. Specific OHV roads are not featured in Alternative B, but high clearance roads will continue to be provided for OHV use at the current level. Under Alternative E, no roads are managed for OHVs. Alternative C has the greatest potential for decreased miles of trail available to mountain bicycling users in the future. Mountain bikes will continue to be allowed in Recommended Wilderness Areas, but are prohibited by law when Congress designates an area as Wilderness. Alternative C provides for increased miles of non-motorized trail, as long as there is no increase in trail maintenance costs. Alternative C makes maintenance of the trail system more challenging, as hand tools must be used rather than power tools in areas designated as Wilderness. Alternative F focuses on improving the existing miles of non-motorized trails and improves and expands the existing ATV/OHV trail systems. It promotes a sustainable trails program that allows for expansion only when the resulting level of maintenance will be equivalent to or less than the existing maintenance needs. Alternatives G, H and I provide for increased motorized and non-motorized trail miles when it is beneficial for the resources (such as relocations off of steep slopes and wet areas) and the extra miles result in no net increase in maintenance. Alternatives G, H and I do not identify specific featured OHV routes, but provide for the current level of high clearance roads to be maintained for OHV use.

## Wilderness/Roadless

**ISSUE STATEMENT:** Forest management strategies may affect the balance between the desires for permanent protection of remote areas and the desires for management flexibility and ability to respond to changes in ecological, social and economic conditions when identifying areas to be recommended for Wilderness and determining how potential wilderness areas and other remote areas should be managed.

### Wilderness

Table 2-14 lists the Recommended Wilderness Study Areas by alternative. With the exception of Whites Peak, all of the areas are either an Inventoried Roadless Area or Potential Wilderness Area, or both. Whites Peak is a remote area recommended for wilderness study by the local county Board of Supervisors.

Table 2-14. Recommended Wilderness Study Areas by Alternative (acres)

Area Recommended for Wilderness Study (Rx 1B) *	Alt A	Alt B	Alt C	Alt D	Alt E	Alt F	Alt G	Alts H and I
Adams Peak (PWA, IRA)			8,200					
Archer Knob (PWA)			7,100					
Beards Mountain (PWA, IRA)			10,100					
Beech Lick Knob (PWA)			14,100			11,600		5,700
Big Schloss (PWA, IRA)			28,400			7,200		
Crawford Knob (PWA, IRA)			14,900					
Dolly Ann (PWA, IRA)			9,600					
Duncan Knob (PWA)			6,000					
Elliott Knob (PWA, IRA)			11,100					
Galford Gap (PWA)			6,700					
Gum Run (PWA, IRA)			14,500					
High Knob (PWA, IRA)			5,600					
- Dry Run (IRA)			7,200					
- Skidmore (IRA)			5,600			5,600		

Area Recommended for Wilderness Study (Rx 1B) *	Alt A	Alt B	Alt C	Alt D	Alt E	Alt F	Alt G	Alts H and I
Jerkentight (PWA, IRA)			27,300					
Kelley Mountain (PWA, IRA)			12,900					
Laurel Fork (PWA, IRA)			10,200			10,200		
Little Alleghany (PWA, IRA)			15,400			15,400		
Little Mare Mountain (PWA)			11,900					
Little River (PWA, IRA)		9,300	30,200		12,700	12,700	9,300	9,500
Massanutten North (PWA, IRA)			16,600					
Oak Knob-Hone Quarry Ridge (PWA, IRA)			16,300					
Oliver Mountain (PWA, IRA)			13,100			8,700		
Paddy Knob (PWA)			6,000					
Potts Mountain (PWA)			7,000			4,200		
Ramsey's Draft Add. (PWA, IRA)		6,100	19,100		3,100	12,400	6,100	6,100
Rich Hole Addition (PWA, IRA)		4,700	12,100	4,700	4,700	11,100	4,700	4,600
Rich Patch (PWA)			900					
Rough Mountain Add. (PWA, IRA)			2,100		2,100	2,100		1,000
St Mary's North (PWA)			3,000					
St Mary's South (PWA, IRA)	1,500		1,700		1,700	1,700		
St Mary's West (PWA)		300	300	200	200	200	300	300
Shaws Ridge (PWA)			7,300					
Shawvers Run Add (PWA)			100					
Three Ridges Add North (PWA)			100			100		
Three Ridges Add South (PWA)			200			200		
Three Ridges Add SW (PWA)			9			9		
Three Ridges Add West (PWA)			100			100		
Three Sisters (PWA, IRA)			9,900	5,500		5,500		
Southern Massanutten (IRA)			12,100					
The Friars (IRA)			2,000					
Whites Peak				4,200		4,200		
TOTAL ACRES	1,500	20,400	386,800	14,600	24,500	113,300	20,400	27,200

\* PWA = Potential Wilderness Area; IRA = 2001 Inventoried Roadless Area

Alternative C recommends all of the Inventoried Roadless Areas and Potential Wilderness Areas for wilderness study. Alternatives B, E, G, H and I focus on stand-alone wilderness areas and wilderness area additions that result in wilderness areas of a size and scale where natural processes can begin to be the dominant influence on the areas. Alternative F was based on recommendations from several wilderness advocacy groups. Many of the Potential Wilderness Area boundaries were adjusted to accommodate important bicycle trails, roads and other uses that would be excluded with wilderness designation. This alternative would result in about 14 percent of the GWNF in Recommended Wilderness Study Areas.

#### **National Scenic Area Recommendations**

Since the actual management of any National Scenic Area (NSA) would be determined by the legislation, it is assumed for this analysis that the legislation would be similar to that used to designate other NSAs in Virginia. Designation as a National Scenic Area would prevent the construction of roads, the harvest of timber, the development of minerals, and construction associated with special use permits. Non-motorized recreation would continue, including bicycle use and hunting. The use of prescribed fire would be allowed. In Alternative D the 8,000 acre Adams Peak area is recommended as a National Scenic Area. In Alternative F three National Scenic Area recommendations include: the Virginia portion of Shenandoah Mountain between Highway 33 and Highway 250; Kelley Mountain; and Adams Peak for a total of 130,000 acres. In Alternatives H and I about 67,500 acres (excluding internal areas recommended for wilderness study) are recommended for designation as a National Scenic Area on Shenandoah Mountain.

#### **Potential Wilderness Areas and Inventoried Roadless Areas**

The GWNF has 23 Inventoried Roadless Areas (IRAs) with a total of 242,278 acres. As part of the revision process, the Forest identified 37 areas as Potential Wilderness Areas (PWAs) with a total of 372,631 acres. The PWA inventory includes all of the IRAs, with the exception of Southern Massanutten and The Friars. For those remote areas that are not identified for Recommended Wilderness Study or recommended for National Scenic Area designation by Congress, some people would like to see them managed to protect their roadless qualities and others would like to see them actively managed for wildlife habitat and timber production.

Alternative A does not have guidelines that require that all IRAs retain their roadless characteristics, yet the management prescribed for the areas accomplishes nearly the same result. Ninety-five percent of the IRAs are classified as unsuitable for timber production in Alternative A and road construction is prohibited on 88 percent of the areas with some exceptions to provide for site-specific needs. However, this alternative would allow some activities in a few portions of the IRAs that would not be consistent with the 2001 Roadless Area Conservation Rule (RACR). In Alternative C, all of the Inventoried Roadless Areas are recommended as wilderness study areas, thereby protecting their roadless qualities and their management would be consistent with the 2001 RACR. In Alternatives F, G, H and I all of the Inventoried Roadless Areas that are not recommended for wilderness study have direction to maintain their roadless character using a standard prohibiting road construction and timber harvest (with limited exceptions) and their management would be consistent with the 2001 RACR. In Alternatives B, D and E, most of the Inventoried Roadless Areas that are not recommended for wilderness study have the same direction as described for Alternatives F, G, H and I. However, in a few of the areas (nine in Alternative B, six in Alternative D and two in Alternative E) active management (including road construction and timber harvest, which are activities that would not be consistent with the 2001 RACR) would be allowed where active management has occurred along existing roads over the past forty years. These areas are identified in Table 2-15. All other areas of Inventoried Roadless Areas would have management direction to maintain their roadless character. In addition, Alternatives B and D would allow salvage harvest (which would be an activity that would not be consistent with the 2001 RACR) from existing roads with no new road construction in any of the Inventoried Roadless Areas.



Table 2-15. Inventoried Roadless Areas without Plan Direction to Retain Roadless Character (acres)

Inventoried Roadless Area Name	Area	Portions of Area Without Plan Direction to Maintain Roadless Character							
		Alt A	Alt B	Alt C	Alt D	Alt E	Alt F	Alt G	Alts H and I
Crawford Mountain	9,852	N/A	1,200		1,400				
Dolly Ann	7,866	N/A	800		600				
Dry River (WV)	7,254	N/A	500						
Elliott Knob	9,391	N/A	200						
Jerkentight	16,849	N/A	800		800				
Little Alleghany	10,207	N/A	700		1,000	1,000			
Little River	27,180	N/A	1,000						
Rich Hole Addition	10,919	N/A	1,500		1,500	1,500			
Oak Knob	10,852	N/A	800		1,200				

NOTE: Management activities in Inventoried Roadless Areas are conditional on the 2001 Roadless Area Conservation Rule. During the development of the issues and alternatives in this EIS, the 2001 RACR was under litigation and subject to changes in policy. Currently the 2001 RACR is in effect and applies to all IRAs. While Forest Plan management direction would allow timber harvest and road construction in some IRAs under Alternatives A, B, D and E, the 2001 RACR would not allow such activities to be implemented. Forest Plan direction under Alternatives C, F, G, H and I would be the same as the 2001 RACR for all of the IRAs.

Management of the 144,500 acres in the Potential Wilderness Area (PWA) inventory that are outside of the IRA boundaries varies among the alternatives. Some of the acres are allocated to Recommended Wilderness Study Areas, some are allocated to management prescriptions that emphasis a remote character and some are allocated to management prescriptions that allow active management including road construction and timber production. Table 2-16 below provides a list, by alternative, of the PWAs and their acres that are allocated to areas that allow active management.

Table 2-16. Potential Wilderness Area Acreage (Not in IRAs) Allowing Active Management by Alternative

Potential Wilderness Area Name*	Alt A	Alt B	Alt C	Alt D	Alt E	Alt F	Alt G	Alts H and I
Adams Peak (PWA, IRA)	900				800		800	800
Archer Knob (PWA)	7,100	7,100		7,100		7,100	2,200	2,000
Beards Mountain (PWA, IRA)	2,600			1,800		1,800	1,800	1,800
Beech Lick Knob (PWA)	14,100	8,500		8,500			5,800	4,900
Big Schloss (PWA, IRA)	7,500	7,500		7,300	7,300		7,300	7,300
Crawford Knob (PWA, IRA)	4,900	4,900		4,900	2,400	2,400	4,900	4,900
Dolly Ann (PWA, IRA)	1,600	1,600		1,600	1,100	1,100	1,100	1,100
Duncan Knob (PWA)	6,000	6,000		5,900	2,300	1,300	2,600	2,600
Elliott Knob (PWA, IRA)	1,700	1,700		1,700	1,700		1,700	1,700
Galford Gap (PWA)	6,700	6,700		6,700	6,700		6,700	6,700
Gum Run (PWA, IRA)	1,900	1,900		1,400				
High Knob (PWA, IRA)	5,600	5,600		5,300			4,100	4,100

Potential Wilderness Area Name*	Alt A	Alt B	Alt C	Alt D	Alt E	Alt F	Alt G	Alts H and I
Jerkentight (PWA, IRA)	10,500	10,500		10,400	4,300	4,300	3,700	5,000
Kelley Mountain (PWA, IRA)	5,200	5,200		300	300	300	2,800	2,800
Laurel Fork (PWA, IRA)	200	200						
Little Alleghany (PWA, IRA)	5,200	5,200		5,200	5,200		5,100	5,100
Little Mare Mountain (PWA)	11,900	11,900		11,700		5,400	7,400	7,400
Little River (PWA, IRA)	3,000	3,000		2,400		2,400	1,500	1,500
Massanutten North (PWA, IRA)	7,000	7,000		5,000	5,000	5,000	5,000	5,000
Oak Knob-Hone Quarry Ridge (PWA, IRA)	5,500	5,500		4,400				
Oliver Mountain (PWA, IRA)								
Paddy Knob (PWA)	6,000	6,000		5,100	5,100		5,100	5,100
Potts Mountain (PWA)	7,000	7,000		7,000			7,000	7,000
Ramsey's Draft Add. (PWA, IRA)	6,300	6,300		5,500	4,700		3,400	5,400
Rich Hole Addition (PWA, IRA)	1,300	1,300		1,300	1,300		1,100	1,100
Rich Patch (PWA)	900	900						
Rough Mountain Add. (PWA, IRA)	900	900		800			900	800
St Mary's North (PWA)	3,000	3,000						
St Mary's South (PWA, IRA)	200	200					200	200
St Mary's West (PWA)	300							
Shaws Ridge (PWA)	7,300	7,300		7,200				
Shawvers Run Add (PWA)	100	100						
Three Ridges Add North (PWA)	100	100						
Three Ridges Add South (PWA)	200	200						
Three Ridges Add SW (PWA)	9	9						
Three Ridges Add West (PWA)	100	100						
Three Sisters (PWA, IRA)	1,700	1,700		1,100	1,500		1,500	1,500
TOTAL ACRES	144,500	135,100	0	119,600	49,700	31,100	83,700	85,800

\* PWA = Potential Wilderness Area; IRA = 2001 Inventoried Roadless Area

## Timber Harvest

**ISSUE STATEMENT:** Forest Plan management strategies may affect: a) the amount and distribution of land suitable for the sustainable harvest of timber products; b) the amount of timber offered by the Forest; c) the role of timber harvest in benefitting local economies and other multiple use objectives; and d) the methods used to harvest the timber. If the Forest responds to needs for wood biomass energy, unlimited small diameter utilization may affect nutrient cycling, wildlife habitat, and soil productivity and stability. Timber harvest may have effects on other resources.

Table 2-17 compares several indicators for this issue by alternative. The Allowable Sale Quantity is the maximum amount of timber that can be sold on lands suitable for timber production during the first decade of implementing any alternative. The purposes of timber production for Alternative A are to provide early successional habitat for: terrestrial species biodiversity, wood product demand, balanced age class concerns, and increased game populations. Alternatives B, E and F focus the timber program on providing early successional habitat based on terrestrial species biodiversity, ecosystem restoration and other ecological objectives.

Alternative D is the alternative that focuses the most emphasis on providing commodities, jobs and income to the local economies; therefore it has the greatest amount of timber production. Alternative C does not allow for a timber production program.

Table 2-17. Comparison of the Timber Harvest Issue by Alternative

Issue	Alt A	Alt A <sup>1</sup>	Alt B	Alt C	Alt D	Alt E	Alt F	Alt G	Alts H and I
Age Class Distribution in 2040 (percent of forested acres)									
0-10 (1% in 2010)	2	0	3	0	4	2	1	3	3
11-40 (9% in 2010)	6	2	7	1	9	5	3	7	7
41-80 (7% in 2010)	10	10	10	10	10	10	10	10	10
81-100 (36% in 2010)	1	1	1	1	1	1	1	1	1
101-130 (33% in 2010)	35	41	36	40	34	38	40	36	36
131-150 (8% in 2010)	26	26	23	28	22	24	25	23	23
150+ (6% in 2010)	20	20	20	20	20	20	20	20	20
Timber Management (thousands of acres)									
Lands Suitable for Timber Production	350	350	499	0	495	367	281	449	452
Acres Regeneration Harvest (Total First Decade)	24	5	30	0	42	18	10	30	30
Million Board Feet (MMBF)									
Allowable Sale Quantity (Total First Decade)	235*	235*	279	0	529	155	96	276	276
Million Cubic Feet (MMCF)									
Allowable Sale Quantity (Total First Decade)	47	47	55.8	0	105.8	31.1	19.1	55.2	55.3
Percent of Current Annual Total Demand for GWNF Timber									
Total Market Demand (255 MMCF/decade)	18	9	22	0	41	12	7	22	22

\*In order to compare across the alternatives, the volume shown for Alternative A (current Forest Plan) is shown using the same current Regional conversion factor as the other alternatives, which is different from the conversion factor used in the 1993 Forest Plan.

Alt A<sup>1</sup> represents the effects of the level of activities accomplished during 2009 through 2011.

## Economics and Local Community

**ISSUE STATEMENT:** Management activities may affect the economic role of the Forest, particularly the role it plays in the economy of local communities, including the production of ecosystem services and commodity outputs. Increasing population and development near the Forest may influence access to the National Forest and management activities such as special use requests, fire management, and responses to additional recreation demands.

Table 2-18 highlights the differences between the alternatives' effect to the local communities with respect to economic impacts, such as jobs and income. This table does not include the impacts from Marcellus shale development; however, those impacts are presented in Chapter 3, Section D of this EIS.

Table 2-18. Comparison of the Economics and Local Community Issue by Alternative

Alternative	Average Annual Jobs Contributed by Forest Service Management, Decade 1	Average Annual Labor Income from Forest Service Management (thousands of dollars), Decade 1	Cumulative Decadal Present Net Values of Benefits and Costs (millions of dollars, 4% discount rate cumulative to midpoint of 5 <sup>th</sup> decade)
Alt A	633	\$25,021	\$1,427
Alt B	623	\$21,171	\$1,606
Alt C	474	\$14,345	\$1,339
Alt D	733	\$25,743	\$1,745
Alt E	565	\$19,111	\$1,486
Alt F	554	\$18,339	\$1,676
Alt G	626	\$21,308	\$1,635
Alts H and I	630	\$21,416	\$1,641

## Climate Change

**ISSUE STATEMENT:** Changes in climate may require adaptation strategies that facilitate the ability for ecosystems and species to adapt to changes in conditions (such as stream temperature, community vegetation composition, and invasive species). Forest management activities may exacerbate the impacts of climate change or mitigate the impacts through adding to or sequestering carbon or enhancing opportunities for alternative energy sources (wind, biomass, solar).

Based on current projections, the primary regional-level and state-level predicted effects of climate change that would impact the GWNF include: (1) warmer temperatures; (2) extreme weather events; and (3) increased outbreaks of insects, disease, and non-native invasive species. Whether temperatures rise or moisture regimes become drier or wetter, most people support the development of a plan that maintains or restores healthy and resilient ecosystems that can adapt to future changes. Comments suggest that the Plan should address reducing current threats to forest conditions, such as from non-native invasive species, pests and pathogens, acid deposition, or human uses of forest resources. Some comments identify the need to provide migration corridors, which include altitudinal gradients, for plant and animal species, especially those most vulnerable to changing climate conditions. Another adaptation strategy is to reduce other stressors to species that are vulnerable to climate change impacts. Other comments requested that we evaluate how management activities may exacerbate, mitigate or enhance effects of a changing climate. Others identified the importance of the forest's role in carbon sequestration.

The alternatives provide different emphases on both adaptation (ways to maintain forest health, diversity, productivity, and resilience under uncertain future conditions) and mitigation (such as carbon sequestration by

natural systems, ways to provide renewable energy to reduce fossil fuel consumption, and ways to reduce environmental footprints). These emphases focus on:

- 1) Reducing vulnerability by maintaining and restoring resilient native ecosystems;
- 2) Providing watershed health;
- 3) Providing carbon sinks for sequestration;
- 4) Reducing existing stresses;
- 5) Responding to demands for cleaner energy including renewable or alternative energy; and
- 6) Providing sustainable operations and partnerships across landscapes and ownerships.

### **Reduce Vulnerability by Maintaining and Restoring Resilient Native Ecosystems**

Alternative C focuses on passive restoration and relies predominantly on natural processes to reduce vulnerability. Alternative C will do some active restoration in reducing roads which may improve the ability for some species to disperse, reduce sedimentation in streams, and reduce the spread of non-native invasive species. The reduction of roads would also reduce access to areas for management activities that could improve diversity and address recreation needs. Alternatives A, B, D, E, F, G, H and I all use a mix of active and passive restoration strategies. Alternative E has the most aggressive approach to active restoration with the largest prescribed fire program and active vegetation management through timber harvest and maintenance of grasslands and shrublands. Alternatives A, B, D, E, G, H and I maintain management options to address changes in the sensitive spruce system in Laurel Fork. Alternatives B, C, D, E, F, G, H and I all utilize the Ecological Sustainability Evaluation tool to develop strategies to maintain and restore the nine ecological systems and the species with special needs. All of these alternatives incorporate the use of wildfire as a tool for achieving resource management desired conditions. All of these alternatives utilize planting of blight-resistant American chestnuts as a restoration tool (Alternatives B, D, E, F, G, H and I allow for more opportunities for planting in open conditions which are likely more conducive to establishment of stands of American chestnut). Alternatives B, D, E, F, G, H and I all maintain or restore ecological conditions that are rare on the GWNF, such as high elevation grasslands and early successional habitat, open woodlands, and old fields. These alternatives all identify the need to address shortleaf pine restoration opportunities.

### **Watershed Health**

Alternative A places a high priority on protecting water quality through the identification of riparian areas and standards that fully protect water quality. This alternative did not address many of the practices and objectives discussed for the other alternatives, but these practices and objectives would be in keeping with the goals of Alternative A.

Alternatives B, C, D, E, F, G, H and I all incorporate the following:

- Beaver meadows, wetlands, and floodplains are protected and restored to improve natural storage, reduce flood hazards, and prolong seasonal flows.
- Riparian forests are protected and restored to moderate changes in stream temperature, maintain stream bank stability, and provide instream habitat.
- Aquatic migration barriers are removed and habitat connectivity re-established so that species can move to more suitable habitat, or move to or from refugia.
- Flood and wildfire risks are reduced in vulnerable watersheds to prevent increased surface erosion and mass wasting leading to aggradation of river channels.
- Roads are improved or decommissioned to reduce adverse impacts during large storms to prevent surface erosion and fill slope failure and landslides. Stream crossings and bridges are constructed to withstand major storm and runoff events.
- Standards are included to assess geologic hazards for management activities, including potential landslide hazards and risks, particularly as the population and infrastructure continue to increase in areas adjacent to the National Forest.
- Bare soil is revegetated as soon as possible and suspend or eliminate recreation uses that are causing elevated sediment levels to streams and large areas of long-term loss of soil productivity outside the designated use area.

- Riparian buffers are increased and standards included for protecting channeled ephemeral streams.
- Soils highly sensitive to acid deposition and nutrient loss are identified. Unlimited small diameter utilization is not allowed in those areas.

Alternative C would have fewer opportunities to restore stream channels, address acidified streams, address geologic hazards and address fire risks than the other alternatives due to the greater acreage in wilderness.

### **Carbon Sequestration**

Alternative C relies on old-aged forests to sequester carbon. The other alternatives use a mix of old-aged forests and harvest to regenerate new forests. The regeneration also has the advantage of creating a diversity of ages and structure in the forest to provide multiple strategies for addressing carbon storage. All of the alternatives are skewed to emphasize a substantial portion of the forest to be in older aged stands.

Forest management in Alternatives A, B, D, E, F G, H and I can increase the ability of forests to sequester atmospheric carbon while enhancing other ecosystem services, such as improved soil and water quality. Planting new trees and improving forest health through thinning and prescribed burning will increase forest carbon in the long run.

### **Existing Stresses**

Aside from the stresses identified in watershed health and restoring resilient native ecosystems, non-native invasive species is a key existing stress on systems. Alternatives B, C, D, E, F, G, H and I all take an aggressive approach to controlling non-native invasive species and preventing their introduction and spread. An early detection and response strategy associated with non-native invasive species will be critical to limit new introductions. Aggressive treatment of established invasive species, along with the control of insects and diseases, are likely to become more critical to maintaining desired conditions for healthy forests under a changing climate. Due to the fragmented land ownership patterns, success in reducing forest pests will sometimes require going beyond national forest boundaries, and continued work with partners will be needed. In addition, management practices (such as thinning and age class diversity) that sustain healthy forests and provide adequate nutrients, soil productivity, and hydrologic function promote resilience and reduce opportunities for disturbance and damage. Alternative C would reduce the spread of many non-native invasive species by restricting management that creates openings in the forest canopy. However, it also restricts the ability to use some control activities in wilderness and to use silvicultural techniques to manage pests like the southern pine beetle.

### **Alternative Energy Demands**

The sources of renewable or alternative energy that can be provided on the GWNF include wind energy, solar energy, and natural gas leasing. Alternative A has the largest area of the GWNF available for gas leasing. Alternatives C and I allow no new federal gas leases. The other alternatives allow for an intermediate level of development. Development of wind energy is allowed in some areas of the GWNF in Alternatives B, D, F G, H and I with the most area available in Alternative D. Alternatives C and E do not allow the development of wind energy on the GWNF.

### **Sustainable Operations and Partnerships**

Under all of the alternatives the GWNF will work with the state of Virginia to incorporate the greenhouse gas emissions from our management activities into a State inventory, just as we have done with the fine particulates inventory. The Forest will continue striving to reduce its environmental footprint and decrease the greenhouse gases emitted through day-to-day operations, including the use of more fuel-efficient vehicles, reducing the number of miles driven and making facilities more energy-efficient. The Forest will also continue working with partners, including other federal agencies, State and local governments, non-governmental organizations and other stakeholders to be more effective in efforts to adapt lands, ecosystems, and species to climate change. Examples are The Nature Conservancy in the Fire Learning Network and the Chesapeake Bay Partnership.