

## APPENDIX E: SUMMARY OF THE ANALYSIS OF THE MANAGEMENT SITUATION

The Analysis of the Management Situation (AMS) is a determination of a forest's ability to supply goods and services in response to society's demands [36 CFR 219.12(e)]. The AMS for the Forest began with a review of the significant issues in the 1993 Forest Plan and then included new issues that have developed to identify need for change items. The AMS also included analyses of the supply and demand conditions for recreation, timber and minerals and examined benchmarks for defining several maximum and minimum ranges within which alternatives could be constructed. Supply and demand for rangelands was not done due to the small range program on the Forest. The AMS provided a beginning basis for determining the need for change in the existing Forest Plan direction and formulating a broad range of reasonable alternatives. As the development of the Plan progressed through evaluation of the alternatives and additional public involvement, not all of the conclusions or recommendations from the AMS were incorporated in the Plan. The following is a brief summary of the Analysis of the Management Situation, including demand and supply conditions for several resource commodities [36 CFR 219.11(a)] and a description of the benchmarks used to frame alternative development [36 CFR 219.12(e)].

### NEED FOR CHANGE IDENTIFIED IN THE AMS

**Fragmentation (Successional Habitat).** The large unfragmented blocks identified in the 1993 Plan should continue to have desired conditions emphasizing mature vegetation and late successional stages. However, because of greater understanding of the habitat needs for many different species, this desired condition should be expanded to include the need for forest structural diversity, including restoration of more open canopy, late successional stages. This is largely developed through the reestablishment of a historic fire regime that has been suppressed since federal ownership. There is also a need to maintain desired conditions for early successional habitat distributed throughout much of the Forest. To improve progress towards the desired condition for early successional habitat, objectives for prescribed fire should be identified in addition to timber harvest objectives.

**Old Growth.** The George Washington NF is largely an aging Forest. The acres of Forest that meet the definition of old growth, as defined by southern region guidelines for old growth management, increased from 154,000 to 253,000 between 1993 and 2008. During the next fifteen years, the old growth community is expected to increase another 130,000 acres. Combined with future old growth that will develop in wilderness, backcountry recreation areas and special biological areas, it is expected that old growth will be well distributed in a network of small, medium and large blocks across the Forest. We should formally adopt the southern region guidelines, to be compatible with the other Forests and make all Old Growth Forest Types, except types 21 (Dry-Mesic Oak Forests) and 25 (Dry & Dry-Mesic Oak-Pine Forests), unsuitable for timber production. With the large amount of identified old growth found in these two forest types and the amount of future old growth anticipated in the next planning period, the need for diversity of age and structure within these two forest types to meet habitat needs is more important than the need for additional acres of old-aged stands. All candidate stands for harvest should be inventoried for their old growth characteristics before making a decision to harvest.

**Riparian Areas.** Adopt as standards the Jefferson Forest Plan Riparian Corridor and Forestwide Channeled Ephemeral standards (consistent with the Federally Listed Threatened and Endangered Mussel and Fish Conservation Plan developed for both Forests) into the plan and have them applicable across the entire George Washington National Forest. The Plan should acknowledge the importance of beavers as a keystone species in the restoration of riparian ecosystems and develop plan components to enhance their populations.

**Management Indicator Species (MIS).** Use the following species as MIS for the Plan: beaver; pileated woodpecker, ovenbird, chestnut-sided warbler, acadian flycatcher, eastern towhee, black bear, wild turkey, white-tailed deer, hooded warbler, scarlet tanager, pine warbler, wild brook trout, and Cow Knob salamander. This allows greater consistency with MIS chosen for the Jefferson National Forest Plan, as well as other Appalachian Forest Plans.

**Threatened, Endangered, and Sensitive (TES) Species.** Create new Special Biological Areas to protect the shale barren rockcress, smooth coneflower, Virginia sneezeweed, and the Northeastern bulrush. Delineate the Primary and Secondary Cave Protection areas (as shown in the Forest's 1998 Indiana Bat Amendment) and correspondingly, adopt the Jefferson Forest Plan direction for these areas.

**Special Biological Areas.** Adopt the proposed new areas and expansions to existing Special Biological Areas.

**Ecosystem Management/Ecological Restoration.** Add a new Desired Condition regarding American chestnut recovery. Add plan components addressing the following: improving the quality of unhealthy stream systems within unhealthy watersheds; maintenance or enhancement of native ecosystems; restoration of fire-dependent ecosystems; restoration of structural and species diversity in forest systems; treating non-native invasive species; aquatic organism passage; and maintenance or enhancement beaver populations on the Forest.

**Fire.** Define and identify fire's role, including prescribed fire and wildfire, in the ecosystem. Acknowledge that some of the Forest will be suitable for the use of wildfire to restore and maintain desired ecological conditions and that safety of firefighters and the general public and the protection of life and property are the highest priorities. Define the values to be protected from and/or enhanced by managing wildfire. Increase the objective for planned prescribed fire to meet restoration and maintenance needs for threatened, endangered, sensitive, and locally rare species, the yellow pine community and other vegetative communities across the Forest.

**Groundwater, Caves and Karst.** Include desired conditions and standards and guidelines to protect karst areas and caves, including the areas identified by the Commonwealth of Virginia.

**Forest Pests and Invasive Species.** Develop a Forest strategy for managing non-native invasive species (NNIS) including a Forestwide Desired Condition and objectives for treating NNIS on the GWNF. This strategy should address prevention of infestations, control of existing infestations, public education, identification of non-native invasive species, inventory protocols, and treatment methods.

**Lands Suitable for Timber Production.** Strive to maintain at least the existing amount of forest suitable for timber production between 350,000 to 370,000 acres to provide for wildlife habitat, forest health, and local community economic needs.

**Salvage.** The recent increase in gypsy moth activity has revived the need to consider salvage harvest guidance. Include desired conditions and standards that allow salvage.

**System Roads across the Forest.** It does not appear that there is a need for an objective for increasing permanent road construction. Old unauthorized roads continue to be identified and other roads are identified that no longer meet access needs. Taking into consideration the issues identified, the benefits and risks analyzed and the recommendations for a minimum road system contained in the 2010 Transportation Analysis Process, there should be an objective to decommission roads.

**Licensed Off-Highway Vehicle (OHV) Use.** Should not provide designated OHV routes or areas in the Forest Plan. The roads and trails open or seasonally open to OHVs can change due to resource conditions and management objectives and the locations of open roads are included on the Motor Vehicle Use Maps, which are periodically updated.

**Existing Inventoried Roadless Areas.** The portions of the areas that were managed as Remote Highlands in the 1993 Forest Plan should be identified as remote backcountry areas. These should continue to be managed as unsuitable for timber production and with a prohibition for road construction (with limited exceptions). The use of salvage in these areas should be addressed. Many of the remote backcountry recreation areas should be expanded to include the entire Inventoried Roadless Area.

**Wilderness.** Adopt desired conditions and standards in the revised Plan that allow fire to play its natural ecological role within Wilderness.

**Aesthetics.** Adopt the Scenery Management System to maintain the high level of emphasis on scenic quality across the Forest and remain current with direction provided in the Agriculture Handbook for Scenery Management.

**Federal Minerals.** As changes are made in the Forest Plan, we will likely need to update the oil and gas leasing availability. The Revised Plan should continue to offer opportunities to explore and develop federal leasable minerals (energy minerals, such as natural gas, and non-energy minerals) and federal mineral materials while providing integration with, and protection of, surface resources. Furthermore, site-specific analysis on any ground-disturbing mineral activity must still occur.

**Private Mineral Rights on Federal Lands.** Consider outstanding and reserved mineral rights throughout the planning process. Adopt standards to assure proper review of mineral rights during project implementation.

**Wind Energy Development.** Identify the following special areas as unsuitable for locating wind energy development (commercial wind farms): Wilderness or wilderness study areas; special botanical, zoological, geological, or research natural areas; Shenandoah Mountain Crest (Cow Knob Salamander Habitat); both Indiana Bat protection areas; Appalachian Trail corridor; remote backcountry areas; Mount Pleasant National Recreation Area; and Big Schloss, Laurel Fork, and Little River Special Areas. Proposals for wind energy development in other areas would be addressed following Agency policies for special use permits and any Agency policy specifically for wind energy development.

**Dispersed Recreation.** Use the basic Recreation Opportunity Spectrum (ROS) inventory classes. In addition, use the new ROS inventory to help identify remote backcountry areas and evaluate potential wilderness areas. Any potential projects in the future that could affect the current ROS setting will be addressed through site-specific project analysis.

**Grazing.** Include a desired condition for bottomland hardwood forest as well as pastoral setting (managed through grazing, burning, mowing, or hay fields) and adopt standards similar to those in Jefferson Plan Revision for riparian and soil resource protection, which includes practices recommended by the Natural Resource Conservation Service (NRCS).

**Drinking Water.** In the revised plan, identify drinking water supplies that depend on the national forest. Establish guidelines that protect water quality for endangered and threatened aquatic species and drinking water. In the strategy section of the revised Plan, identify the importance of considering downstream uses in determining priorities for watershed improvement activities.

**Climate Change.** A climate change strategy should be incorporated into the Revised Plan.

## SUMMARY OF SUPPLY AND DEMAND CONDITIONS

### Range

The range program on the George Washington NF is so small in scope that supply and demand conditions were not considered necessary.

### Recreation

The market area for recreation was defined as all counties that fall within a 75-mile straight-line radius from the Forest border. For the George Washington National Forest (GWNF), the market area entails portions of Virginia, West Virginia, Pennsylvania, Maryland and North Carolina. The population living within the market area is about 9 million people. Opportunities for outdoor recreation within the market area are not limited to the GWNF. Within the market area, the U.S. Forest Service offers additional opportunities on the Jefferson and Monongahela National Forests. The National Park Service offers opportunities in Shenandoah National Park,

Blue Ridge Parkway, Harpers Ferry National Historic Park, C&O Canal National Historic Park, multiple historic sites, and the National Capital Region (mall, memorials and historic sites in Washington, DC). All of these areas connect and expand opportunities for recreation on federally managed public lands. The Appalachian National Scenic Trail also provides a unique long distance hiking opportunity north to south across the entire length of the market area. It connects multiple National Forests and Parks as well as State Forests and Parks from northwest Georgia to northwest Maine, with approximately one-fourth of its length being in Virginia.

Currently, there are 59 developed sites managed by the George Washington National Forest to accommodate different recreation activities (Table E-1). The Forest Service defines the capacity of developed recreation sites in terms of "people at one time" that a site can support, called PAOTs.

Table E-1. Current Supply of Day-Use Developed Areas on George Washington NF

Site Type	Number of Sites	Total Capacity (PAOTs)
Motorized Boating Sites*	2	350
Campgrounds & Complexes**	21	6,740
Horse Campgrounds	1	25
Interpretive Sites	10	815
Observation Sites	4	485
Picnic Sites	10	730
Swimming Sites*	7	945
Target Ranges	4	120
Grand Total	59	10,210

Source: INFRA-Recreation Sites Report. INFRA is a Forest Service database that contains all developed recreation sites inventory data.

\*Coles Point offers both a swimming area and a boat ramp. The entire capacity of Coles Point is listed with the swimming site.

\*\* All of the level 5 campgrounds and three of the level 4 campgrounds have day lakes with sand swimming beaches. The capacity of these day use areas is included with the Campgrounds & Complexes.

The supply of lower development scale, more primitive facilities provided by the Forest currently exceeds demand. Occupancy is typically low at the majority of the development scale 2 and low 3 recreation sites, with seasonal variability. For most of the lower development scale sites, occupancy increases during spring and fall hunting seasons, but rarely to full capacity at most sites.

At the upper end of the development scale, the public demand for campsites is greater than the demand for lower development scale sites. However, demand rarely exceeds supply, except during the summer holiday weekends. The exception to this is Sherando Lake family campground, which routinely fills to capacity throughout the summer. Across the Forest, demand for campsites with utility hookups exceeds supply. The Forest has not installed additional utility hookups in recent years due to the cost of installation and ongoing maintenance, desires to reduce the carbon footprint, and in keeping with our Forest's recreation niche which is primarily trails and dispersed recreation. State parks and privately owned campgrounds meet some of the public demand for sites with utility hookups and other amenities for visitor comfort. State parks and private sector campgrounds are typically more highly developed than Forest Service campgrounds.

Dispersed recreation is defined as those activities that occur outside of developed recreation sites such as boating, hunting, fishing, hiking and biking. There are 56 developed recreation sites that support dispersed use of the forest such as trailheads, trail shelters and boat ramps. Table E-2 provides a summary of the developed areas used to access dispersed recreation opportunities on the national forest.

Table E-2. Developed Access Points for Dispersed Recreation on the George Washington NF

Site Type	Number of Sites	Total Capacity (PAOTs)
River and Lake Boating Access	9	325
Fishing Sites	7	701
Observation Sites	3	96
Hang Gliding Sites	4	70
Trail Shelters	13	109
Trailheads	20	1,307
Grand Total	56	2,608

The George Washington National Forest offers approximately 1,078 miles of trails. The majority are for non-motorized, multiple uses and are shared by hikers, equestrians and bicyclists. Notable exceptions are the Appalachian National Scenic Trail and several short interpretive trails that are open to hikers only and trails in designated Wilderness where bicycles are prohibited. Also excluded from multiple uses are some trails within developed recreation areas. Approximately 65 miles on three trail systems provide motorized use opportunities. All three trail systems are open to all-terrain vehicles and motorbikes, and one has portions open to off-highway or four-wheel drive trucks.

Table E-3 gives a breakdown of the miles of trail that are managed for various types of uses. The total trail miles do not add up to the total National Forest System Trail miles because of the overlap in uses allowed.

Table E-3. Approximate Miles of Trail Offered on the George Washington NF

Type of Trail	Miles	Comment
Wilderness	68	Total of approximately 1,078 miles
Non-Wilderness	1,010	
Trail miles that allow hikers	1,078	
Trail miles that allow equestrians	811	All except Appalachian Trail, interpretive trails, and trails within developed recreation areas including angler trails
Trail miles that allow bicyclists	794	All except Appalachian Trail, trails in designated Wilderness, interpretive trails and certain trails within developed recreation areas including angler trails
Trail miles that allow ATVs and OHVs	65	Allowed on designated motorized trails only

Demand for long-distance trails for special recreation events, such as long-distance mountain bicycling, equestrian endurance rides and runner marathons, has increased in recent years. The demand is greatest among the equestrian and mountain biking communities. Events are not permitted in designated Wilderness and neither of these user groups is permitted on the Appalachian National Scenic Trail. Concern has been expressed among some in these user groups that any additional Wilderness designations should exclude, to the extent possible, trails that currently are used, or that by their connectivity to other trails could be used, for long-distance trail riding opportunities and special recreation events. There is more demand than supply for motorized trail opportunities.

The ability of the Forest to provide such a significant trails program is largely dependent on the volunteer workforce that helps with maintenance of trails. In fiscal year 2010, volunteers contributed 50,928 hours to the dispersed recreation program, equivalent to 28 full time employees. The motorized trail program relies heavily on grants from the Virginia Recreational Trails Fund program. While support from volunteers and the grant programs have been consistent, a decline in either of these programs will have negative implications for the sustainability of the dispersed recreation program.

Hunting and fishing are traditional and popular dispersed recreational uses of the George Washington National Forest. The Forest Service manages the habitats that sustain populations of small and big game species as well as cold and warm water fisheries. The Virginia Department of Game and Inland Fisheries and the West Virginia Department of Natural Resources stock certain streams and lakes.

The Virginia Department of Conservation and Recreation has been sampling participation rates in outdoor recreation since 1965. According to the *2007 Virginia Outdoors Plan*, the two highest needs for outdoor recreation in the next five years are access to recreational waters of the state and trails close to home. Table E-4 shows the results of the *2006 Virginia Outdoors Survey* (Virginia Outdoors Plan, 2007) with the most popular outdoor recreation activities in Virginia.

Table E-4. Ranking of Outdoor Recreation Activities Based on Percent of Households Participating (Source: 2007 Virginia Outdoors Plan)

Activity	Percent of Population, 2006	Percent of Population, 2002	Percent of Population, 1996
Walking for pleasure	72	67	65
Visiting historic sites	56	40	35
Driving for pleasure	55	62	60
Swimming	44	52	53
Visiting nat. areas, parks	44	27	24
Sunbathing on beach	36	39	42
Fishing	26	42	29
Picnicking	26	29	31
Using a playground	25	24	24
Boating	24	34	31
Jogging	24	22	20
Visiting gardens, arboretums	21	22	20
Bicycling	21	40	31
Camping	18	28	26
Hiking, backpacking	16	18	15
Golf	14	25	20
Basketball	12	15	12
Fitness trail	10	7	6
Soccer	9	9	6
Snow skiing, boarding	9	12	13
Tennis	8	16	20
Hunting	7	14	17

The West Virginia Development Office produced a 2009 Statewide Comprehensive Outdoor Recreation Plan (SCORP) that included a 2008 recreation survey of state residents. Walking, birdwatching, fishing, and hunting activities all ranked above 35%, followed by camping and canoeing at 7%. The SCORP reports that hunting levels and economic returns have remained high compared to other states and national trends.

However, in Virginia, a significant trend in outdoor recreation activities indicated in the *2006 Virginia Outdoor Survey* is the decline in the numbers of hunters in Virginia. In the past 10 years, hunting has decreased from an activity engaged in by 17 percent of households in 1994 to 7 percent of households in 2006. According to the 2007 Virginia Outdoors Plan “the continued change in land use patterns from rural to urban and suburban may have driven this change. Sixty-five percent of hunters in Virginia hunt on private lands. The lack of access to previously hunted private lands due to landowner changes has also driven a change in supply of lands for hunting. In fact, where lands remain rural, hunting participation rates are much higher than in the urban crescent (Northern Virginia). Participation in the mountain region was 21.4 percent, Piedmont region was 16.4 percent and Chesapeake region was 16.5 percent, as contrasted with the participation rates of 6.1 percent in the urban crescent.”

Table E-5 provides Forest Service projections in public participation in outdoor recreation activities on the George Washington NF. This list of individual activities or activity composites was derived from the National Survey on Recreation and the Environment and was adjusted for the GWNF.

Table E-5. Fifty Year Projected Activities in Outdoor Recreation on GWNF (number of people, in thousands)

Recreation Activity	2010	2020	2030	2040	2050	2060
<b>Camping</b>						
Developed Camping	105.16	117.44	130.13	140.87	151.81	163.68
<b>Driving</b>						
Driving For Pleasure	47.77	53.38	59.19	64.06	68.98	74.36
Other Motorized Travel	0.83	0.93	1.03	1.12	1.20	1.30
Motorized Water Travel	24.42	27.23	29.74	32.29	35.36	38.78
TOTAL FOR GROUP	73.02	81.55	89.96	97.47	105.54	114.45
<b>Fishing</b>						
Fishing	189.82	208.12	224.94	238.62	253.22	268.93
<b>General</b>						
General Relaxing	74.05	82.75	91.75	99.30	106.93	115.28
Swimming	57.19	64.51	71.78	78.49	85.70	93.63
TOTAL FOR GROUP	131.24	147.27	163.53	177.79	192.63	208.91
<b>Hiking</b>						
Hiking/Walking	210.56	237.34	265.76	291.31	318.09	347.74
<b>Hunting</b>						
Hunting	99.49	104.57	108.09	110.14	112.29	114.34
<b>Nature</b>						
Visiting Nature Centers, VIS	1.23	1.38	1.54	1.69	1.83	1.99
Gathering Berries, Natural Products	10.92	12.31	13.74	15.00	16.31	17.75

Recreation Activity	2010	2020	2030	2040	2050	2060
TOTAL FOR GROUP	12.15	13.69	15.28	16.68	18.14	19.74
<b>Off-Highway Vehicles</b>						
Off-Highway Vehicles	8.34	9.03	9.56	10.15	10.88	11.65
<b>Primitive Camping</b>						
Primitive Camping	5.01	5.52	6.00	6.44	6.91	7.42
Backpacking, Camp in Unroaded Areas	3.34	3.68	4.00	4.29	4.61	4.95
TOTAL FOR GROUP	8.35	9.20	10.01	10.73	11.52	12.36
<b>Picnicking</b>						
Picnicking	7.36	8.22	9.11	9.86	10.63	11.46
<b>Trails</b>						
Bicycling	15.13	17.05	18.88	20.79	22.99	25.46
Horseback Riding	2.52	2.82	3.08	3.37	3.73	4.13
Non-Motorized Water Travel	1.67	1.82	1.93	2.07	2.24	2.42
TOTAL FOR GROUP	19.32	21.69	23.90	26.23	28.96	32.02
<b>Viewing</b>						
Viewing Scenery	117.33	131.12	145.38	157.35	169.43	182.66
Viewing Wildlife, Birds, Fish	72.95	82.47	92.70	100.67	108.36	116.76
TOTAL FOR GROUP	190.28	213.60	238.08	258.02	277.80	299.42
<b>Wilderness</b>						
Wilderness	11.48	12.64	13.75	14.75	15.83	16.99
<b>TOTAL FOR ALL GROUPS</b>	<b>1,066.56</b>	<b>1,184.35</b>	<b>1,302.08</b>	<b>1,402.63</b>	<b>1,507.33</b>	<b>1,621.68</b>

Data Source: Bowker, J. M., and Askew, Ashley (forthcoming). Outdoor Recreation Participation Projections 2010 to 2060. In: Outdoor Recreation Trends and Futures: Technical Document Supporting the Forest Service 2010 RPA Assessment. GTR-SRS-150. Asheville, North Carolina: U.S. Department of Agriculture, Southern Research Station. The data for three projections scenarios were averaged by Paul Arndt, Regional Planner, U.S. Forest Service Southern Region. Omitted from the list are various winter sports, which are not relevant to projections for the Southern Region.

## Timber

The market area for timber production on the George Washington NF was defined as a 50 mile radius around the Forest border. This market area includes a total of 64 counties in 3 States (2 counties in Maryland, 41 counties in Virginia, and 21 counties in West Virginia). A total of 19.2 million acres are contained within this market area (.7 million acres in Maryland, 11.5 million acres in Virginia, and 7 million acres in West Virginia). The GWNF comprises approximately 5.5% of the land within the market area.

Information regarding the supply of timber was compiled using the most recent available Forest Inventory and Analysis (FIA) data. The two largest categories of timberland owners in the market area include privately held and National Forest Service (NFS) lands (including the entire George Washington National Forest and then portions of the Jefferson and Monongahela National Forests), accounting for 96% of the timberland in this market area. There are approximately 26.7 Billion Cubic Feet (bcf) of live volume on these timberlands, with

about 9 bcf occurring as sawtimber. Roughly three-quarters of the total volume occurs on private lands while another 20% occurs on National Forest Lands.

However, not all of this 27 bcf of volume within the market area is available as a supply of wood products. Worthington et al. (1996) examined several factors which result in changes to availability of this standing volume; primarily economic consideration and landowner attitudes. Worthington et al. concluded that approximately 67% of the standing volume was economically available based on exhaustive modeling and analysis given market conditions in 1996. Of course markets have changed since that time. Data published by the Appalachian Hardwood Center, an affiliate of West Virginia University, indicates that Red Oak stumpage prices have fallen by 165% since 1996 (red oak is a major component of the hardwood products in this market area and is used as a proxy for all sawtimber for this purpose). Hardwood pulp stumpage increased by 250%, since 1996. When considering that 35% of the standing volume in the market area is sawtimber and 65% is pulp (a vast majority of which is hardwood pulp), these decreases and increases over time balance each other. Overall stumpage prices in this market area are about 104% of the 1996 stumpage prices. Thus, the findings in Worthington et al. can still be used to approximate current market conditions for this broad scale analysis. Therefore it can be estimated that a total of approximately 18 bcf is economically available in the market area; 14 bcf on privately held lands, 3 bcf on National Forest System lands, 1.5 bcf of that on the GWNF, and 1 bcf on other public lands.

Landowner attitudes are a large influence in wood product availability, especially on the private lands that compose a vast majority of this market area. Worthington et al. estimated that about 14% of private landowners reflect a "never harvest" segment of the market. Within the remaining segment, dollar returned was considered the primary factor in wood availability. They further estimated that an additional 41% of the standing volume would not be available because the value returned would not be high enough for the landowner to sell. Thus, a combined reduction of 55% of the volume could be considered unavailable on privately held lands. This means that in general 45% of the economically available volume on private lands would actually be available considering landowner attitudes, equating to approximately 6.3 bcf of total standing volume.

This concept of landowner attitudes can also be extended to public lands. Much of the Other Federal lands in the market area include reserved lands administered by the National Park Service and Fish and Wildlife Service, meaning this volume would also fall into the "never harvest" segment of the market. Similarly, about 32% of the current GWNF (1993 Plan) is considered suitable for timber production. The availability of volume on State and Municipal lands varies widely, but this area is such a very small component of the market area (about 4%), that those lands do not figure heavily in wood product availability in the market area as a whole. For the purposes of this analysis we will estimate that 1 bcf would be available on National Forest System lands and .51 bcf of that on the GWNF, after considering lands unsuitable for timber production. From 0 to 1 bcf is available on all other lands.

Thus, it is estimated that a total standing volume of approximately 7 to 8 bcf would be available as a timber supply on all lands in the market area, equating to a 70% reduction of the total standing live volume in the market area. We can expect this to grow by about 0.57 bcf per year.

Although the scope of this analysis is very broad encompassing some 64 counties in 3 States, we believe it is also important to consider the role of NFS lands on a more local level. National Forest System lands occupy more than 30% of the land base in three of the counties in the market area and a few more counties contain 20-30% NFS lands. Certainly the role that the timber supply from Forest lands play in these local economies can be important and should not be lost or discounted when taking a larger view.

Biomass fuels for the generation of energy are gaining interest and support in many parts of the south. The potential to supply biomass fuels from the GWNF is included in the aforementioned estimates. Of the .51 bcf available as supply, anywhere from 0 to .25 bcf could potentially be utilized as biomass fuel, or a maximum of 8.75 million tons forestwide. The upper bound of this estimate is the small roundwood component usually utilized in paper production plus the traditionally non-merchantable material in branches and tops; we presume that no sawtimber would be utilized as biomass fuels. However, it is important to note that under

current management (1993 Plan) the entire Forest only produces about 70,000 tons of wood, including sawtimber. This puts the almost 9 million ton figure identified as a maximum into perspective; it is probably not realistic.

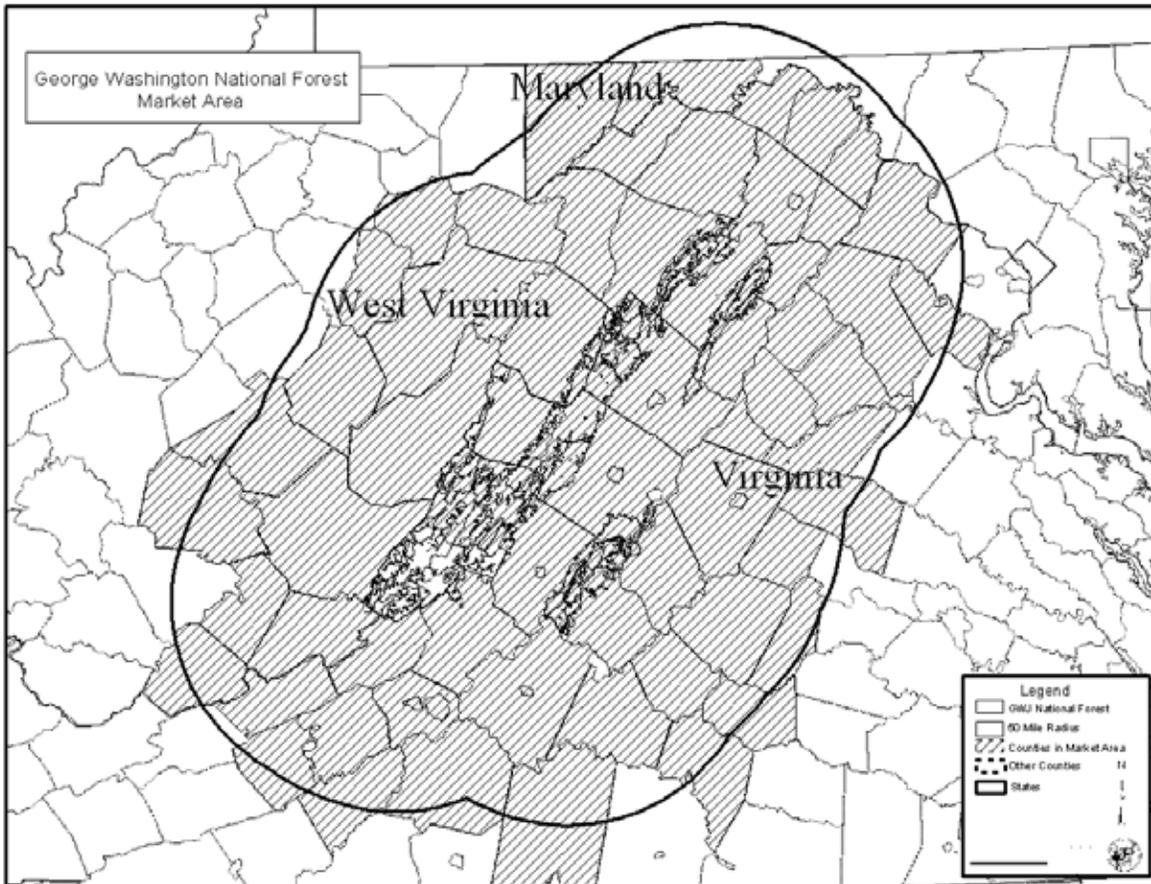


Figure E-1. Market Area for George Washington National Forest Wood Products

## Minerals – Federal Leasable Oil and Gas

The federal government owns 100% mineral rights on about 84% of the Forest. Private parties own mineral rights on the remaining 16% of the Forest. As of September 2010, federal oil and gas leases were in effect on about 1% of the Forest (10,243 acres) but there are no active oil and gas wells. Exploration on GWNF lands has been sparse and activity on surrounding lands has been minimal. Thus far, only five wells have been drilled on Forest lands. All were designed to test a specific horizon and all were dry holes. Two small natural gas fields have been developed adjacent to GWNF lands, but, with the exception of one well, there has been no drilling activity since the 1990s.

Several oil and gas plays exist in the area. The most significant of these plays is related to the Marcellus Shale which is present on the surface and in the subsurface under more than half of the GWNF lands. Current industry focus directed toward the exploration for and exploitation of organic shales, and in particular the Marcellus, is high at this time. Development of the Marcellus shale is generally done with horizontal drilling and use of hydraulic fracturing at numerous locations throughout the horizontal bore holes. Marcellus shale-type

development through horizontal drilling has not yet occurred on the Forest. Patchen and Avary (2008) state, "The Middle Devonian Marcellus Shale is the oldest, thickest and most widespread of four formations in the Hamilton Group of central and eastern New York. This black shale unit extends from New York southward to Virginia and West Virginia, and westward into eastern Ohio where it pinches out beneath the Middle Devonian unconformity. In Ohio, the Marcellus Shale generally is not separated from younger rocks in the lower Olenitangy Formation; in Virginia, the Marcellus usually is included in the basal portion of the thick Millboro Shale." Enomoto (2009) states, "In the Virginia portion of the Appalachian Basin, the Devonian Mahantango Formation and the Marcellus Shale are mapped collectively as one unit that is named the Millboro Shale. This unit in Virginia consists of black, fissile shale units, with interbeds of dark gray argillaceous limestone or calcareous shale. Thin, dark gray, aphanitic limestone beds occur near the base. Geophysical logs from wells drilled in Highland and Rockingham counties, Virginia, indicate that the thickness of the Millboro Shale ranges from 368 to 570 feet thick in this region." The following table shows the estimated extent of the Marcellus shale formation on the Forest, as it relates to oil and gas leasing considerations.

Table E-6. GWNF Mineral Status and Marcellus Shale

Mineral States	Acres	Percent of GWNF (%)	Marcellus Shale Acres	Percent of Land Status in Marcellus Shale (%)
Total GWNF Acres	1,065,499	100.0%	592,300	55.6%
Withdrawn from mineral leasing by law	50,727	4.8%	22,537	44.4%
Not withdrawn from mineral leasing by law	1,014,772	95.2%	569,763	56.1%
Outstanding or reserved mineral rights - Partial or complete private mineral interest (subtotal of "not withdrawn" acres)	167,206	15.7%	97,615	58.4%
100% federal mineral ownership (subtotal of "not withdrawn" acres)	847,566	79.5%	472,148	55.7%
Existing federal oil & gas leases	10,243	1.0%	10,243	100.0%

Future projections of the kind and amount of oil and gas activity that could be reasonably anticipated began with a Reasonable Foreseeable Development Scenario (RFD) prepared by the Bureau of Land Management (BLM). The RFD is based on the assumption that all lands on the Forest would be available for oil and gas leasing under standard lease terms and conditions, except for those areas withdrawn from leasing by law (Wilderness and National Scenic Area). It covers a time period of 15 years and includes all lands within the boundaries of the George Washington National Forest (GWNF) regardless of mineral estate ownership. Privately owned mineral rights are constitutionally protected property rights and can be exercised at any time. The Forest Plan can identify lands with federal mineral rights as administratively unavailable for federal leasing in addition to those withdrawn by law. Therefore, the RFD can be viewed as the 'maximum' amount of federal oil and gas leasing activity projected.

The RFD estimated that a maximum of 20 vertical exploration/evaluation wells could be drilled over the next 15 years which will prove the presence of productive Marcellus Shale in the area of the GWNF. Additionally, 50 vertical and 249 horizontal development wells could be drilled.

## Minerals – Federal Leasable (other than oil and gas)

Historically, iron mining and some coal mining occurred on the Forest. But there is no recent interest in these or other hardrock leasable minerals. Some geothermal leasing occurred on the Forest in the 1980s, but there has been no recent interest in geothermal leasing.

## Private Mineral Rights (Reserved and Outstanding Mineral Rights)

Private mineral rights (reserved and outstanding mineral rights) underlie about 16 percent of the Forest. These outstanding or reserved mineral rights (non-federal mineral rights) are partial or complete mineral interests. Reserved rights are those retained in part or in whole by the seller when the federal government acquired the tracts comprising the National Forest. Outstanding rights are mineral rights owned and retained by a third party when federal government acquired the tracts comprising the National Forest. Of the privately-owned mineral rights, about 76 percent are mineral rights outstanding to third parties, and 24 percent are mineral rights reserved by the grantor at the time of acquisition by the federal government.

The only active operation under private mineral rights is a shale mine in operation since the 1980s on the Pedlar Ranger District. Since 1993 reclamation of the previous shale mine has occurred, while additional mining has occurred in recent years. In 2005 the James River Ranger District received a proposal to exercise private mineral rights by mining. Forest Service requested additional information about the proposal, but has not received the information. To date, the proponent has not pursued the proposal with the Forest Service.

## BENCHMARK ANALYSIS

Benchmark analysis is specified in the NFMA regulations in 36 CFR 219.12(e) as part of the Analysis of the Management Situation. Benchmarks approximate maximum economic and biological resource production opportunities and are useful in evaluating the compatibilities and conflicts between individual resource objectives and in defining the range within which integrated alternatives can be developed. The following benchmark analyses are consistent with the minimum applicable management requirements of 36 CFR 219.27.

**Minimum Level of Management Benchmark** 36 CFR 219.12(e)(1)(i). This benchmark represents the minimum level of management needed to maintain and protect the GWNF as part of the National Forest System. This level of management does involve some activities and costs in order to meet the following minimum management requirements:

- Protect the life, health, and safety of incidental users;
- Prevent environmental damage to the land or resources of adjoining lands of other ownerships or downstream users;
- Conserve soil and water resources;
- Prevent significant or permanent impairment of the productivity of the land; and
- Administer unavoidable non-Forest Service special uses and mineral leases, licenses, permits, contracts, and operating plans.

Alternative C in the DEIS embodies most of the elements of a minimum level of management; however some activities are allowed in this alternative to make it a more realistic and viable option. The activities in Alternative C that involve more than a minimum level of management include: the continued operation of three ATV use areas; more of an emphasis on non-motorized recreation that would include an increase in trail miles; and continued operation of some developed recreation sites.

**Maximum Physical and Biological Production Potential Benchmarks** 36 CFR 219.12(e)(1)(ii). These benchmarks identify the maximum physical and biological production potentials of significant individual goods and services together with associated costs and benefits. For ecological systems, the maximum biological

production is represented by the desired conditions for the cove, spruce, northern hardwood, oak and pine systems in Chapter 2 of the Plan.

**Maximum Timber Benchmark.** This benchmark is used to identify the maximum timber production potential of the Forest, subject to these specifications:

- The objective function maximizes timber volume in the first five decades, with a rollover to maximize present net value for 15 decades.
- All tentatively suitable acres are included, without any management prescription allocations, so every tentatively suitable acre is eligible for harvest.
- No successional habitat constraints are applied.

Several key results of the maximum timber benchmark are:

- 910,000 tentatively suitable acres are allocated to timber production
- Annual harvest is 19.68 MMCF (98.4 MMBF)
- Annual harvest is 10,331 acres
- Cumulative Present Net Value over five decades is \$117,447,000
- Long-term sustained yield is 23.66 MMCF

**Maximum Wilderness Benchmark.** This benchmark is used to identify the maximum potential of the Forest to provide areas that meet the definition of wilderness according to the 1964 Wilderness Act. In Chapter 2 of the DEIS, Alternative C represents this benchmark, with the recommendation for wilderness study all of the 37 areas in the Potential Wilderness Area inventory as well as Southern Massanutten Mountain and the Friars Inventoried Roadless Areas. This benchmark represents 386,800 acres recommended for wilderness study and 20,000 existing Wilderness acres.

**Maximum Natural Gas Production Benchmark.** This benchmark is used to identify the maximum potential for the Forest for natural gas production. This benchmark is represented by the Reasonably Foreseeable Development (RFD) prepared by the Bureau of Land Management that is based on the assumption that all lands on the Forest would be available for oil and gas leasing under standard lease terms and conditions, except for those areas withdrawn from leasing by law. The RFD is described in more detail in Chapter 3 of the DEIS. This benchmark represents the construction of 20 vertical exploration/evaluation wells and 50 vertical and 249 horizontal development wells.

**Present Net Value Benchmarks –** The following benchmarks are described in the 36 CFR 219 regulations.

- 36 CFR 219.12(e)(1)(iii) Monetary benchmarks which estimate the maximum present net value of those resources having an established market value or an assigned value;
- 36 CFR 219.12(e)(1)(iii)(A) For forest planning areas with major resource outputs that have an established market price, monetary benchmarks shall include an estimate of the mix of resource uses, combined with a schedule of outputs and costs, which will maximize the present net value of those major outputs that have an established market price;
- 36 CFR 219.12(e)(1)(iii)(B) For all forest planning areas, monetary benchmarks shall include an estimate of the mix of resource uses, combined with a schedule of outputs and costs, which will maximize the present net value of those major outputs that have an established market price or are assigned a monetary value;
- 36 CFR 219.12(e)(1)(iii)(C) For forest planning areas with a significant timber resource, estimates for paragraphs (e)(1)(iii)(A) and (B) of this section shall be developed both with and without meeting the requirements for compliance with a base sale schedule of timber harvest, as described in s 219.16(a)(1), and with and without scheduling the harvest of even-aged stands generally at or beyond culmination of mean annual increment of growth, as described in s 219.16(a)(2)(iii). The George Washington NF does not have a significant timber resource.

**Timber Maximum PNV Benchmark.** This benchmark was established to estimate the schedule of outputs and costs that would maximize the present net value of timber production without any constraints, subject to these specifications:

- The objective function maximizes net present value over the entire planning horizon.
- All tentatively suitable acres are included, without any management prescription allocations.
- No successional habitat constraints are applied.

Several key results of the maximum timber benchmark are:

- 910,000 tentatively suitable acres are allocated to timber production
- Annual harvest is 17.66 MMCF (88.3 MMBF)
- Cumulative Present Net Value over five decades is \$112,392,000
- Long-term sustained yield is 19.53 MMCF

Maximum Present Net Value Benchmarks were not modeled for resources other than timber since use of the Spectrum Model (linear programming model that determines the best mix of outputs and activities to maximize an objective function, such as present net value) was confined to timber harvest outputs and activities. There is no method to maximize the present net value of other resources but the present net values of several resource programs under each alternative was evaluated and displayed in the FEIS.

## SUMMARY OF SIGNIFICANT ISSUES

Comments received since the start of the process in 2007 through the scoping and public meetings held in 2010 were used to develop the significant issues that guided the development of the alternatives and plan direction. Issues were determined from collaborative workshops and written comments. The significant issues are as follows:

### ACCESS

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

**BACKGROUND:** System roads are the primary means of motorized access to the national forest. However, they are also a source of concerns including the environmental effects of roads (on water quality, soil erosion, and habitat) and the social effects on remote settings. Some people would like to see the motorized access to the national forests increased, especially during hunting seasons for big game, for other recreational uses, or to meet forest management needs. Other people, however, feel that road construction should be limited and some existing roads decommissioned. Other comments were made that new roads should not be constructed for the purposes of logging or for OHV use. The amount of motorized access will need to be balanced with wildlife habitat needs, the need to provide both motorized and non-motorized recreational opportunities, the need to protect the soil and water resources, the need to have management access, and the financial capability of maintaining safe and environmentally secure roads.

### WATERSHEDS, SOIL AND WATER QUALITY, RIPARIAN RESOURCES AND AQUATIC DIVERSITY

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

**BACKGROUND:** Providing favorable flows of water was the main objective of the Organic Administration Act that created the forest reserves and of the Weeks Act that allowed the purchase of lands for National Forests in the eastern U.S. Water continues to be one the most important resources produced on the Forest. A number of communities in Virginia and West Virginia obtain their drinking water from the National Forest, whether their water supply watershed is completely within the Forest boundary or their supply is a river that is downstream

from the Forest. The Forest is also an important component of the Chesapeake Bay watershed. There are streams within and downstream of the Forest that have impaired water quality. Most of these impairments are due to acid deposition or to agriculture and none have been attributed to management activities on the Forest. Water quality and aquatic systems can be affected by acid deposition, roads, trails, past storm events, insects and disease, nonnative invasive species and other disturbances. Streams on the forest provide habitat for a number of species at risk, including brook trout and the James spiny mussel. The projections for climate change in this area indicate an increase in temperature, which could affect aquatic species, especially trout populations. Climate change projections are more uncertain on whether precipitation will increase or decrease in the southeast over the next 30-100 years but droughts or extreme weather events each would have impacts to future water quantity and quality conditions. Climate change could also increase acid deposition effects on soil productivity. Currently, the biggest concerns for aquatic habitats on the Forest are sedimentation, future sources of large woody debris for self-maintaining diverse habitat components, canopy cover to maintain water temperature regimes, impacts from roads, and acid rain.

### TERRESTRIAL BIOLOGICAL DIVERSITY

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

**BACKGROUND:** Ecological communities provide the foundation for biological diversity. Ecosystems identified on the Forest include communities that predominate on the landscape (e.g. Central Appalachian Dry Oak-Pine Forest); communities that are declining, rare, or unique (e.g. Caves and Karstlands); and communities that provide habitat for species with potential viability concerns (e.g. Special Biological Areas). For the GWNF, management of ecological communities primarily involves the use of timber harvest and fire to influence vegetation composition and structural diversity of habitats. Some comments were concerned about the current age class distribution on the forest being too skewed toward the mid- to late-successional habitats and that management is needed to provide a mosaic of habitats, especially early successional habitat, which is needed by many species. They cited bird and animal species in decline that require early successional habitat at some point in their life cycle. Others thought the focus on the GWNF should be on providing habitat for species requiring late successional habitat or large home ranges since these conditions are rarer on private lands. They stated that private lands can provide for early successional habitat needs and natural disturbances can create openings on the Forest. Some comments identified the importance of the oak-hickory community in the Central and Southern Appalachians for species diversity and are concerned about oak regeneration and the continuity of future hard mast production.

### OLD GROWTH

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

**BACKGROUND:** Nearly all the lands that became the George Washington National Forest had been harvested at least once before becoming National Forest System lands. However, in many areas of the Forest, stands of trees have reached ages and structural conditions that qualify as "old growth" under the current definitions used in the Southern Region of the Forest Service. Old growth communities provide both biological and social values. Old growth trees provide large cavity trees for wildlife species such as black bear, birds, other cavity nesters, and large downed woody habitat for other species such as salamanders. Ecologically, old growth provides elements for biological richness, gene conservation, and riparian area enhancement. Old growth areas also provide certain recreational experiences, research opportunities, educational study, and provide historical, cultural, and spiritual values. Some may never visit an old growth site, but will receive satisfaction from knowing that it exists. On the other hand, old growth areas can be a source of large-diameter, high-value hardwoods, which are limited in supply and in high demand for such specialty products as furniture, musical instruments, and timberframe homes. Others say that insect and disease risk can be relatively high in old growth stands and could (for some community types) threaten the retention of those stands as old growth. There is concern that fire exclusion could favor a buildup of fire-intolerant, but shade-tolerant, species that could eventually replace the original old growth type. Another view is that active management, including timber harvest and prescribed fire, could be used to accelerate the development of old growth attributes.

## FOREST HEALTH

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

**BACKGROUND:** While the term “Forest Health” can have several meanings, it is used here to identify the effects of invasive species. While not all nonnative species are known to disrupt native ecosystems, of particular concern are those that are successful at invading and rapidly spreading through natural habitats. These include a wide variety of organisms such as the chestnut blight fungus, gypsy moth, hemlock wooly adelgid, didymo algae, and Ailanthus. In addition to these non-native species, forest health also includes the native southern pine bark beetles. Invasive species create a host of harmful environmental effects to native ecosystems including: displacement of native plants; degradation or elimination of terrestrial and aquatic habitat; extirpating rare species; impacting recreation; affecting fire frequency; altering soil properties; and decreasing native biodiversity. Invasive species spread across landscapes, unimpeded by ownership boundaries. Control of existing populations, prevention of the spread of known invasive species, mitigation of existing problems, and prevention of the introduction of new invasives are all components of this issue.

## WIND ENERGY

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

**BACKGROUND:** Wind energy is renewable and can reduce the use of fuels generating carbon gases, reduce acid deposition, and positively affect climate change. The USDA Forest Service and National Renewable Energy Laboratory (2005) identified 35,810 acres (primarily ridgetops) of the GWNF with a high potential for wind area development. The GWNF is in close proximity to growing population centers that would benefit from additional and clean energy production. However, there are concerns about the effects of utility-scale wind tower development to water, birds, bats, views, visuals, aesthetics (height of towers), noise, carbon sequestration, and fragmentation of habitat. These concerns relate to both construction and operation of utility-scale wind turbines and the associated infrastructure development to support the turbines (roads, powerlines). Some people believe that this need for wind energy development can and should be met on private lands, or that the power would not be used to solve local needs. Other people believe that the National Forests should contribute to the development of renewable resources and green energy.

## OIL AND GAS LEASING

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

**BACKGROUND:** Energy production has long been a component of National Forest System management and gas development provides energy to meet national needs. There are no active gas wells currently in production on the Forest and only about 10,200 acres are currently under lease for gas and oil. A particular type of gas well operation is the development of gas deposits within the Marcellus shale formations, through horizontal drilling and use of hydraulic fracturing at numerous locations throughout the horizontal bore holes. Concerns about hydraulic fracturing include the quantity of water needed in the process, negative effects on water quality (ground and surface), wildlife, air quality, viewsheds, forest fragmentation, road systems, nearby private landowners, and ecotourism. Some public comments identified that developing Marcellus shale gas is okay when it is properly regulated and that National Forest System land should be available for leasing Marcellus shale so that people can maintain their standard of living and meet energy needs. Other comments stated that there must be an effects analysis for hydraulic fracturing or that there should be a moratorium on development until federal/state regulations are in place and an on-going EPA study is complete. Other comments are opposed to this development or want limitations on where it could be used.

## FIRE

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

BACKGROUND: Fire is acknowledged as an important part of some ecosystems on the Forest. Aggressive control of wildfire throughout much of the twentieth century resulted in changes to these ecosystems. Management of both wildfire and prescribed burning can serve to restore and maintain these ecosystems, while also protecting National Forest and adjacent lands from negative effects of fire. Some people support the continued and increased use of prescribed fire to restore ecosystems, create wildlife habitat, encourage oak regeneration and reduce fuels. Some comments support the proposed increase in use of prescribed fire, but caution that fire does not replace timber harvest as a management tool; rather it should be considered an additional option for timber management. Some comments identified concerns with prescribed burning, including impacts on adjoining private land, carbon emissions, native vegetation, invasive species, stream sedimentation, and air pollution. Some people indicated support for using lightning ignited fires only to achieve ecosystem restoration goals.

## RECREATION

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

BACKGROUND: The Forest is within a day's drive for a large population of people in the eastern U.S. Local and regional visitors use the forest for a variety of recreational opportunities, from primitive hiking and camping to developed recreation sites and motorized travel. Developed recreation is not a significant issue. Demand for long-distance trails for special recreation events, such as long-distance mountain bicycling, equestrian endurance rides and runner marathons, has increased in recent years. The demand is greatest among the equestrian and mountain biking communities. There is more demand than supply for motorized trail opportunities as opportunities for such use is very limited on private land. Some people stated that off-highway and all-terrain vehicle use is not appropriate on National Forest due to concerns about noise, and potential environmental damage, and felt the need could be met commercially on private lands.

## WILDERNESS/ROADLESS

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

BACKGROUND: Management of remote areas on the Forest continues to be one of the most prominent issues raised in comments. Remote areas include existing Wilderness, the Inventoried Roadless Areas identified in the 1993 GW Forest Plan Revision (and incorporated into the 2001 Roadless Area Conservation Rule), and the Potential Wilderness Areas (identified as areas meeting the definition of wilderness that need to be evaluated in the current revision process). Public rationale for additional wilderness includes: ecological values of remote, intact areas; recreational values; proximity of large masses of people to the Forest; protection of watersheds through permanent protection; carbon sequestration; ability for latitudinal movement for species due to climate change; future scientific reference; and a need to bring the amount of wilderness on the Forest more in line with amounts on other National Forests. Public rationale opposing wilderness includes: lack of balance of forest age classes (many species are threatened without early successional habitat); limitations on recreation use by those less physically fit; limitations on group size for recreation events; limitations on special use events; prohibiting all motorized and mountain bike access; restrictions on treatment of invasive species; limitations on meeting energy resource demands; limitations on emergency access; firefighting restrictions; and limiting options as conditions or future demands change.

The GWNF has 23 Inventoried Roadless Areas (IRAs) with a total of 242,278 acres. As part of the revision process, the Forest has identified 37 areas as Potential Wilderness Areas (PWAs) with a total of 372,631 acres. The PWA inventory includes all of the IRAs, with the exception of Southern Massanutten and The Friars. For the remote areas in the PWA inventory that are not identified for Recommended Wilderness Study by Congress, some people would like to see them managed according to the direction in the 2001 Roadless Area Conservation Rule (RACR) and others would like to see them actively managed for wildlife habitat and timber production.

## TIMBER HARVEST

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

**BACKGROUND:** Timber harvest is one of the tools used to manage vegetation on the Forest to create a diversity of habitat conditions. It also produces wood products that benefit local economies. The ecological, social, and economic effects of the timber management program on the GWNF, both positive and negative, are of great importance to many. Some people strongly state that the forest should reduce the acres suitable for harvest, reduce the Allowable Sale Quantity (ASQ), and decrease the commercial timber program due to adverse impacts to: water quality, competition with private lands, air quality, scenery, ecological habitats such as large areas of intact forest (fragmentation), and a wide variety of other ecological/environmental resources. Some indicate that commercial timber harvest on the Forest is not economically viable and competes with privately held timber, that demand for timber can be met on private land, or that the level of the timber sale program should be based on reasonable budget expectations. Other people strongly support an expanded timber program because of the positive impacts on: balancing age classes and reducing acres of an aging forest, maintaining species composition, wildlife habitat, responding to an increased demand for wood products (including biomass), reduction of hazardous fuels, and benefits to local economies. Therefore, there should be an increase in suitable acres and Allowable Sale Quantity.

The potential use of forest wood and fiber as biomass for energy production raises concerns on the effects on carbon sequestration and on the removal of too much organic material which could increase soil erosion and/or remove too many nutrients from the site, particularly in low site index areas or areas affected by acid deposition. Some people believe that the Forest should contribute to this green energy demand while meeting other resource needs (fuels reduction and wildlife habitat), that this will produce green jobs and wood products, and that it is better to burn the trees for fuel rather than burning them as part of prescribed burns. Other people don't believe that biomass fuels are a green source of energy, don't believe that energy should take precedence over forest health, or believe that biomass will compete with pulpwood and drive up prices.

## ECONOMICS AND LOCAL COMMUNITY

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

**BACKGROUND:** Some outputs from management activities can be readily valued such as timber, firewood, and recreation fees. Ecosystem services are the suite of goods and services from the Forest that are vital to human health and livelihood and are traditionally viewed as free benefits to society, or "public goods" - wildlife habitat and diversity, watershed services, carbon storage, and scenic landscapes, for example. These outputs and services can all be important to many of the rural communities in and around the National Forest. Several categories of activities identified as important to local communities include tourism (family-based nature activities, recreation events, aggressive trail experiences like all-terrain vehicle trails, equestrian and mountain

bike use, wilderness, new trails), habitat management that increases diversity for wildlife viewing and game populations for hunting, and timber production that supports the logging industry.

## CLIMATE CHANGE

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

**BACKGROUND:** In developing management strategies to deal with a changing climate, it has been recognized that forests can play an important role in both mitigating and adapting to climate change. Mitigation measures focus on strategies such as carbon sequestration by natural systems, ways to increase carbon stored in wood products, ways to provide renewable energy from woody biomass to reduce fossil fuel consumption, and ways to reduce environmental footprints. Adaptation measures address ways to maintain forest health, diversity, productivity, and resilience under uncertain future conditions so that forest resources can better adapt to change. Based on current projections, the primary regional-level and state-level predicted effects of climate change that would impact the GWNF include: (1) warmer temperatures; (2) extreme weather events; and (3) increased outbreaks of insects, disease, and nonnative invasive species. Comments suggested that the Plan should address reducing current threats to forest conditions, such as from non-native invasive species, pests and pathogens, acid deposition, and human uses of forest resources. Some comments identify the need to provide migration corridors, which include altitudinal gradients, for plant and animal species, especially those most vulnerable to changing climate conditions. Other comments requested that we evaluate how management activities may exacerbate, mitigate or enhance effects of a changing climate. Others identified the importance of the forest's role in carbon sequestration.

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