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Southern Region

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FINAL
ENVIRONMENTAL IMPACT STATEMENT
for the
REVISED LAND AND RESOURCE MANAGEMENT PLAN

FILE COPY

GEORGE WASHINGTON NATIONAL FOREST
Virginia West Virginia

FINAL ENVIRONMENTAL IMPACT STATEMENT
for the
REVISED LAND AND RESOURCE MANAGEMENT PLAN
GEORGE WASHINGTON NATIONAL FOREST

Included are the Virginia counties of Alleghany, Amherst, Augusta, Bath, Botetourt, Frederick, Highland, Nelson, Page, Rockbridge, Rockingham, Shenandoah, and Warren;
and the West Virginia counties of Hampshire, Hardy, Monroe, and Pendleton.

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Abstract

Fourteen alternatives for revision of the Land and Resource Management Plan for the George Washington National Forest (the Forest Plan) are described and compared. The alternatives are: 2 – continuation of interim management direction representing current management; 3 – minimal management that produces habitat and services not available on private lands; 4 – a variety of motorized recreation experiences; 5 – marketable goods and services such as timber and huntable wildlife; 6 – non-market goods and services such as wilderness/non-wilderness recreation and fish/wildlife habitat; 7 – quality hunting, fishing, hiking, and nature study, 8 – biological values such as habitat for threatened, endangered, and sensitive species, wildlife viewing/study, combined with multiple use; 8A – RPA alternative with the production of a mixture of uses, values, resources and environmental conditions consistent with the Forest Service ecosystem approach to forest management; 9 – extensive unfragmented forest and wilderness with limited timber production; 10 – goods and services that provide highest revenue efficiently, 11 – biological values emphasizing non-game species and wilderness; 12 – traditional range of goods and services such as timber, recreation, minerals, wilderness, range, and wildlife habitat; 13 – emphasis on unfragmented forest, increased wilderness, and primitive recreation; 14 – address local issues/needs, maintain natural Forest values, achieve multiple-use, minimize value loss. **Alternative 8A is the alternative preferred by the Forest Service.** This differs from Alternative 8 which was identified as the preferred in the Draft Environmental Impact Statement.

GEORGE WASHINGTON NATIONAL FOREST
ENVIRONMENTAL IMPACT STATEMENT

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CHAPTER 1
Environmental Impact Statement

THE REVISION: PURPOSE AND NEED

PURPOSE

This environmental impact statement explores alternatives for revising *The Land and Resource Management Plan* for the George Washington National Forest and for leasing oil and gas in the Alleghany Front Lease Area of the Forest

WHY REVISE?

Since 1976, federal law (the National Forest Management Act) requires that each of the 156 national forests be managed under a forest plan Forest plans — or land management plans — direct all resource management activities in the national forests.

Permission to implement the Forest's 1986 Plan was given by Regional Forester John E Alcock in September 1986. The Plan did not gain public acceptance, however, and was the subject of 18 appeals filed with the U.S Forest Service.

After a prolonged attempt to resolve the questions raised in the appeals, the Chief of the Forest Service remanded the 1986 decision and directed the Regional Forester to revise the Forest's land management plan

The Chief directed improvement in the following areas· the environmental impact statement (EIS), the revised plan, and the process used to accomplish the revision need to be in compliance with NFMA, NEPA and other federal laws and statutes; the EIS and the revised plan need to be more readily understood by the public and agency professionals than the 1986 documents, the revised plan needs to be more easily implemented than the 1986 Plan in terms of understandable management direction and where it is applied; the revised plan needs to correct standards and other management direction that were found inadequate when monitoring the implementation of the 1986 Plan.

WHAT DECISIONS ARE MADE?

The Regional Forester makes decisions on the following policies and publishes them in a Record of Decision document at the conclusion of this revision effort All decisions but one are programmatic decisions, one decision is site-specific·

-Determines the multiple-use goals, objectives, and desired future condition for the Forest, including estimates of the goods and services expected

-Determines multiple-use management area prescriptions (including associated standards) for each management area, including probable and proposed practices

-Identifies land that is suitable for timber production.

-Determines the allowable sale quantity for timber and the associated sale schedule,

-Allocates roadless areas recommended for wilderness study to a management area that maintains the roadless characteristics, allocate other roadless areas to management areas which may or may not retain the roadless characteristics;

-Determines monitoring and evaluation requirements;

-Determines how much land within the Alleghany Front Lease Area can be leased and under what conditions

THE LEASING DECISION

The Forest is working with the Eastern States Office of the Bureau of Land Management in analyzing the various amounts of Forest lands that may be available for natural gas and oil leasing and the different conditions that may be attached to those leases

The 75,000-acre Alleghany Front Lease Area is the land in question (refer to the MINERALS section of Chapter 3 following). This area contains most of the Forest land that has high-to-moderate potential for natural gas and oil

In order to lease federally owned minerals on the Forest, an environmental analysis is required For the leasing of oil and natural gas, the analysis is documented in an environmental impact statement In this case, the analysis is documented here along with analyses performed for the Revised Plan

PUBLIC INVOLVEMENT

Public involvement remains high throughout the revision of the Plan Forest staff held 13 public meetings, some with as many as 100 people in attendance, and open houses on each ranger district Those attending participated in identifying and exploring possible responses to the public issues (the issues are presented in the next section) The public continued to participate as the possible responses developed into 14 alternatives that offer a wide range of management plans for the Forest

In addition to public meetings, Forest staff also met with individuals and with special interest groups throughout the process to provide information and explanations.

Other efforts to keep the public informed and involved in the revision process include a newsletter and a variety of mailings to over 300 individuals, organizations, and agencies.

And finally, in response to the Forest's request for comments on the draft versions of the Environmental Impact Statement and the Revised Plan, more than 4,300 letters were received. Specific comments made in these letters and the Forest staff's responses are included in FEIS Appendix I.

ISSUES GUIDE THE REVISION

Comments from the public, directives from the Chief, and concerns of Forest staff are contained in the 13 issues that follow These issues guide the revision of the Forest Plan Further changes in the EIS and Revised Plan resulted from specific public comments on the DEIS and Draft Revised Plan.

Issue 1: Biological Diversity

Many of the public's comments about the revision effort fall within the concept of biological diversity

Biological diversity — or the diversity of life — includes ecosystem diversity, species diversity, and genetic diversity within a species A major task of the revision effort was to successfully provide for biological diversity while striving to accommodate the variety of goods and services the public wants from their forest.

This document addresses the question of biological diversity by concentrating on eight components of biological diversity· the natural values of the Forest, forest type conversion, old growth, forest fragmentation, late successional habitat, riparian and wetland areas, management indicator species and special biological areas.

The USDI Fish & Wildlife Service is a coordinating agency on the management of Cow Knob salamander, an endemic species nominated for federal listing whose home range is located on Shenandoah Mountain within the boundary of the Forest The Revised Plan was prepared in conjunction with a pre-listing recovery plan for this species

Issue 2:
Below-Cost
Timber Sales

The Forest is a below-cost timber sale forest That means that presently, the expenses of administering the timber sale program exceed revenues received from the sales Many people want these below-cost timber sales to stop; others want to be sure that if we do hold below-cost timber sales, the resulting benefits to other resources justify the below-cost situation

A review of concerns that fall under the Below-Cost Timber Sale issue reflect its complexity Concerns expressed by the public include: (1) opposition to below-cost timber sales, (2) effects of timber harvesting on local communities and economies; (3) role of the Forest's timber program in the local timber market; (4) multiple-use benefits from timber harvesting, (5) failure of the Forest to provide a legitimate rationale for below-cost sales; (6) compliance with a Department of Agriculture decision on the analysis needed to support a Forest Plan with below-cost timber sales, (7) the amount of land that will be deemed suitable for timber management, and (8) timber harvest levels

Issue 3:
Forest Access

This issue reflects the public's concern over access to the Forest and how access should be managed Concern centers around the rights of visitors to have motorized access to the Forest (disabled visitors, in particular), whether new roads should be built, whether roads should be open or closed, the use of four-wheel drive vehicles, and the need for more hiking trails.

Issue 4:
All-Terrain
Vehicle Use

In the past, all-terrain vehicles have been considered legitimate and acceptable on the Forest. But recently, this practice has become a major point of controversy. Comments made by the public deal with both opposition and advocacy of all-terrain vehicle use and the management of the use.

Issue 5:
Roadless Area
Management

There is a good deal of concern over the management of roadless areas Comments from the public indicate they want to protect values that are unique to the Forest, or those that are at least uncommon on private land These values include remote habitat for wildlife, primitive and semi-primitive recreation opportunities, and natural beauty Some roadless areas offer maybe one of these values; some offer all

Concerns to be considered include.

- How much of the roadless areas should be excluded from timber management and other ground-disturbing or vegetation-disturbing activities?
- How should these lands be classified (wilderness, scenic areas, etc)?
- What types of management practices are appropriate on the remaining roadless areas?

Issue 6:
Special Management Areas

Areas receiving special management for recreation are creating more public interest than ever before This issue involves concern over the management of the four existing wilderness areas, the management of areas qualifying for wild and scenic river designation, the designation of Scenic Byways, the management of a number of areas containing special recreational qualities (including Hidden Valley), management of the Appalachian National Scenic Trail, and management of the fisheries

Issue 7:
Aesthetics

Management of the visual resource – or quality of the landscape – continues to be a controversial subject The public has expressed concern over the manner in which the agency manages and inventories the visual resource

Issue 8:
Vegetation

Public comments over vegetation manipulation reflect concern over how timber and other vegetation is manipulated.

By far, the most controversial manipulation is clearcutting. Comments addressing the clearcutting controversy can be divided into four areas of public concern

- Clearcutting should be eliminated or severely curtailed as a harvest method
- Clearcutting should be relied on as the primary harvest method or at least retained as one of the tools used to achieve management objectives.
- Clearcutting must be shown – through site specific analysis – to be the optimum harvest method for achieving management objectives This analysis is a requirement of the National Forest Management Act (NFMA)
- Methods other than clearcutting, such as shelterwood, group selection and single-tree selection, should be relied on.

Another area of concern involves the "featured species" concept of wildlife management and how it is applied through the use of habitat/vegetation manipulation

Issue 9:
Resource Sustainability

The concept of resource sustainability has surfaced as one of the major enviironmental concerns of the nineties This issue reflects the concerns of the public for the future-of-the-Forest-itself rather than for the future-of-the-Forest-as-it-pertains-to-man Concerns have been expressed over ecosystem management, re-introduction of extirpated species, the use of herbicides, the harvesting of timber, the protection of water quality and soil productivity, and the hazards of wildfire.

Issue 10:
Minerals

Comments relating to the minerals issues span a variety of concerns. some people are opposed to mining on the Forest; others oppose oil and gas leasing in the Laurel Fork and Big Schloss areas, some say there should be no surface occupancy in special management areas, no mineral exploration in riparian zones.

There are requests that mined-over lands be reclaimed until the problem areas are eliminated In relation to the management of fluid minerals, a question is raised as to the respective roles of the Bureau of Land Management and the Forest Service

Comments from the Bureau of Mines request that Forest lands remain open to future mineral development; the Revised Plan include a discussion of the minerals that exist on the Forest; Forest policy regarding mineral access and development be clearly presented, disclosure be made of the impacts on the minerals resource when Forest lands are withdrawn from mineral activity

Issue 11:
Gypsy Moth

The presence and continuing threat of gypsy moth creates uncertainty about what the outcome is going to be whether or not the effects of infestation are any worse than the effects of treatment with pesticides; whether changes in species will occur, whether or not impacts on recreation areas and on timber harvests will be significant.

Issue 12:
Adequacy of the Revision

The public expressed concern over the legal and procedural adequacy of the 1986 EIS and Forest Plan Some contended that the EIS had violated NEPA principles by presenting an inadequate range of alternatives and faulty analyses Concerns over the 1986 Plan included. too much of the Forest was assigned to "general forest area" management with no specific direction, and, no clear direction for implementing the 1986 Plan.

Issue 13:
The Mix of Goods and Services

The public comments that form this issue reflect what individuals want from the Forest Comments were particularly aimed at the concern that the Forest has traditionally had too strong an emphasis on timber management Instead, commenters say, emphasis should be on dispersed recreation, developed recreation, and wildlife management There were also concerns over the management of special use permits and grazing allotments

By far, the majority of comments that formed these issues came from the people of Virginia The surrounding areas -- Washington, D C., Maryland, West Virginia, Pennsylvania, Ohio -- were next in responsiveness. Comments from interested people in 29 other states -- including Oregon, Alaska, and Canada -- are also reflected in the issues

THE FOREST PROFILE

Because the Forest is about a two-hour drive from Washington, D C , stretches alongside the popular Shenandoah Valley, and is easily accessible from the heavily populated mid-Atlantic coastline, the spotlight stays on the Forest.

The Forest extends for 140 miles along the Appalachian Mountains of northwestern Virginia and adjacent West Virginia, as the map below indicates. The Forest includes almost 1 million acres of national forest land in 13 Virginia counties and about 100,000 acres in four counties in West Virginia -- a total of approximately 1 1 million acres.

About 30 percent to 35 percent of the total land area in and adjacent to the Forest is devoted to agriculture As is the national trend, active farms and the use of land for agriculture are on the decline.

Landform

The Forest includes the Blue Ridge, Shenandoah, Massanutten and Alleghany ranges of the Appalachian Mountain system, is in the James and Potomac river basins, and lies within the Blue Ridge and the Ridge and Valley physiographic provinces Generally, elevations range between 1,000 feet to 3,000 feet; some mountaintop elevations are over 4,000 feet

Climate

A mild climate prevails subject to considerable variations due to elevation. Annual average precipitation is 38 inches, ranging from 18 to 48 inches Mean annual precipitation increases from the northwest to southeast because of the influence of the Blue Ridge Mountains. Precipitation is well distributed throughout the year. Average annual snowfall in the Forest vicinity varies from 15 to 26 inches The typical frost-free period ranges from 141 days to 175 days

THE REVISION PROCESS: WHAT TO EXPECT

Draft versions of the Revised Plan and the EIS were distributed in December 1991. These documents -- the final versions of the EIS and the Revised Plan -- are accompanied by a Record of Decision document

All documents mentioned are products of a revision effort that began in November 1989 Incorporated in the final documents are the results of the January through April 1991 public comment period During that 90-day period the public was invited to comment on the draft documents More than 4,000 letters were mailed to the Forest -- see EIS Appendix I for the details Also, throughout the final EIS and the Revised Plan, arrows (→) indicate parts of the text that are direct responses to comments made during the 90-day period

Following this chapter and its brief review of the issues, Chapter 2 presents a range of alternative management plans (simply called alternatives). The alternatives developed in much the same manner as the issues -- both are products of intense involvement between the Forest Service and the public. The public and the Forest Service began formulating the alternatives in November 1990. The alternatives are designed to address the issues and to offer a wide range of possible ways of managing the Forest

A summarized comparison of alternatives at the end of Chapter 2 offers the reader an opportunity to weigh the impact of each alternative, if implemented.

Following the alternatives in Chapter 2, Chapter 3 presents before-and-after views of the Forest environment The current environment is discussed first, then the environment as it would be if the alternatives were implemented

The companion document to this EIS is the final version of the Revised Plan. It presents a detailed disclosure of the alternative that the Forest Service is recommending for implementation -- Alternative 8A. Copies of the final versions of the EIS and the Revised Plan have been mailed to interested individuals and organizations and to affected agencies

The Preferred Alternative

Alternative 8A is the Forest Service preferred alternative. A preferred alternative is defined as the alternative that maximizes net public benefits and best accomplishes the mission of the Forest Service in managing the Forest. The mission, by law, is to accommodate the variety of uses of the Forest that the public demands, to accommodate those uses in a manner that ensures the Forest is able to sustain the uses for future generations, and to accomplish it all in an economically efficient and environmentally sound manner.

As the preferred alternative, Alternative 8A is developed into the Revised Plan The Record of Decision that accompanies this document and the Revised Plan gives supporting rationale for the selection of Alternative 8A

Following implementation, the Revised Plan will be monitored and evaluated for effectiveness. At least every five years, the Plan will be reviewed to determine whether or not conditions have changed enough to warrant another revision If not, regulations require a revision in 10 to 15 years from implementation.

PLANNING RECORDS ARE AVAILABLE

The Interdisciplinary Team (ID Team) is the Forest group responsible for developing the Revised Plan. The Team has made an effort to provide detailed explanations of each step of the revision in the form of process (or planning) records This EIS contains summaries of the process records and includes references to the parent records Process records are on file in the Forest Supervisor's Office in Harrisonburg, Virginia. For a copy of any record, contact

Forest Supervisor
George Washington National Forest
P O Box 233
Harrisonburg, Virginia 22801

CHAPTER 2

THE ALTERNATIVES & HOW THEY COMPARE

INTRODUCTION

This chapter presents 14 alternatives for consideration. The alternatives suggest a variety of plans for managing the Forest and are in response to the 13 issues and to public comments on the DEIS. Appendix A gives the details of the procedure used to consolidate public and agency comments into issues. Appendix I contains a breakdown of the substantive comments on the Draft Revised Plan and DEIS.

New Approaches by the Public

The alternatives are products of often intense interaction among the public; state, federal, and private agencies; and Forest staff. And although the Forest Service asks for the public's advice in drafting the alternatives, that advice may or may not be reflected in the final Plan Regardless, advice from the public follows a definite path through the planning process and often creates new approaches for the Forest Service -- new analyses, fresh alternatives.

In helping the Forest Service draft the alternatives presented here, the public exercises their right to be heard and to have their concerns addressed. In choosing the alternative that becomes the Revised Forest Plan, the Forest Service exercises its mission to listen to the public, to seek their advice, and to combine, when possible, public demands with professionally-sound forest management

Regional Forester Chooses Alternative

The responsibility for choosing the alternative that becomes the Revised Plan lies with the Regional Forester. In choosing the alternative, it is the Regional Forester's responsibility to consider national goals set by Congress, goals of the Southern Region, and needs and desires of the Forest's public.

This chapter presents 14 alternatives for consideration. Alternative 8A has been identified as the Forest Service preferred alternative and is the base for the Revised Plan.

Changes to the Alternatives

In response to public comments on the Draft Revised Plan and DEIS and to changes in national and regional policies, there have been a number of changes to the alternatives considered in detail in the FEIS since the publication of the DEIS. In particular, Alternatives 8A has been added and the other thirteen alternatives have had some degree of modification.

In response to public comments on the DEIS, benchmarks have been completed. Benchmarks define the maximum supply capability of the Forest to produce various goods and services and aid the Forest in defining the range of alternatives Appendix B has further information on the benchmarks

ALTERNATIVE ELIMINATED FROM DETAILED STUDY

ALTERNATIVE 1

Alternative 1 was formulated to explore one possible definition of the no-action/no-change-from-current-management alternative. When the Forest amended the Forest Plan to incorporate interim management direction established by the Chief, the Regional Forester and the Forest Supervisor, it was determined that a change in allowable sale quantity from 49 million board feet to 38 million board feet and a reduction of suitable acres to remove lands inventoried as semi-primitive non-motorized recreation opportunity spectrum would constitute a significant amendment. The allowable sale quantity, therefore, was not amended and lands inventoried as semi-primitive non-motorized recreation opportunity spectrum were not changed to lands unsuitable for timber production. The Forest realized that to perform such an amendment would require a NEPA and NFMA analysis comparable to that being performed for the revision.

In formulating Alternative 1, the ID Team found that it could not accurately model the amended Forest Plan in the FORPLAN model. There appeared to be no relationship between the allowable sale quantity and the suitable acres that could be reproduced in the FORPLAN model. The Team was unable to recreate a mixture of management prescriptions that provided the resource yields displayed in the amended Forest Plan given the standards in the Plan. When the ID Team completed the formulation of Alternative 1, it resembled the amended Forest Plan only in a few instances such as the location of "special management areas" and allowable sale quantity.

It became evident that Alternative 1 could only be implemented if the amended Forest Plan were significantly amended. Without these changes, Alternative 1 would be illegal.

In light of this, the ID Team considers it impractical to continue analyzing an alternative that mirrors the amended Forest Plan. Alternative 2 better represents the way the Forest has been managed since the Forest Plan was released in 1986. Therefore, Alternative 1 is eliminated from detailed study.

ALTERNATIVES CONSIDERED IN DETAIL: 2, 3, 4, 5, 6, 7, 8, 8A, 9, 10, 11, 12, 13 and 14

The 14 alternatives considered in detail provide a range of responses to the 13 issues. A number of the alternatives have been modified and three new alternatives have been added to respond to comments on the Draft Revised Plan and DEIS.

Brief descriptions of the alternatives follow. A discussion on management areas has been included to provide more information on the alternatives and to assist in understanding the alternative maps.

In the second half of this chapter, the COMPARISONS section is an aid to a better understanding of the alternatives.

ALTERNATIVE 2

Alternative 2 is the no action/no change alternative. Under this alternative, the Forest continues under management direction in the 1986 Plan and additional interim management direction set forth by the Chief. Alternative 2 was formulated under the assumption that the 1986 Plan would be significantly amended based upon the revision analysis.

Additional camping developments are constructed at Lake Moomaw, Trout Pond and Sherando Lake. Existing and new sites provide full accessibility to persons with disabilities.

Three all-terrain vehicle trail complexes are provided Existing roads open to off-highway vehicle use remain open and maintained.

No roadless areas are recommended for wilderness study.

The allowable sale quantity of timber products is 380 million board feet (or an average annual offer of 38 million board feet per year). 300,000 acres are suitable for timber production. No more than 2,500 acres per year are clearcut.

Sixty-four percent of the Forest is managed to emphasize wildlife species with the standards in the 1986 Plan.

The planning record *Alternative 2* contains a more detailed explanation of this alternative. It includes, by reference, the mitigation measures incorporated in the alternative in the form of standards from the planning records *Management Area Prescriptions* and *Common Standards*.

ALTERNATIVE 3

Alternative 3 is designed to mitigate, nullify and cease human disruption of native biodiversity. Some policy changes needed to implement this new direction may technically lie outside the decision space of the Regional Forester. This alternative contains the assumption that such changes are recommended to the appropriate higher authority by the Forest Supervisor and the Regional Forester.

Alternative 3 calls for a minimal level of manipulation while producing habitat not available on private lands. This alternative creates an extensive wilderness system recommending designation of all roadless areas as wilderness and recommending additional areas. Wildernesses are linked by wildlife travel corridors, buffer zones surround wildernesses where possible.

Under Alternative 3, the Forest is unsuitable for timber production and, to the extent of Forest Service authority, unavailable for mineral exploration and development.

Concentrated human use is limited to developed recreation areas. Two developed recreation areas are closed: Shenandoah Mountain Picnic Area and Locust Springs Picnic Area.

Trails are maintained at a minimum level; foot travel using map and compass skills is encouraged All motorized vehicles are restricted to open roads outside the wildernesses.

No active wildlife or fish management is allowed unless to help a threatened, endangered, or sensitive species Habitat for extirpated species is maintained.

The planning record *Alternative 3* contains a more detailed explanation of this alternative. It includes, by reference, the mitigation measures incorporated into the alternative in the form of standards from the planning records *Management Area Prescriptions* and *Common Standards*.

ALTERNATIVE 4

Alternative 4 provides a variety of motorized recreation experiences. Roads constructed for timber sales are used by off-highway vehicles. Areas currently managed for non-motorized dispersed recreation are reviewed for conversion to motorized recreation as demand warrants. No roadless areas are recommended for any designation that restricts the use of motorized vehicles.

Additional camping developments are constructed at Lake Moomaw, Trout Pond and Sherando Lake. All existing and new sites provide full accessability to people with disabilities.

Nineteen all-terrain vehicle trail complexes are provided. All system roads are open to off-highway vehicle use if such use does not cause significant environmental degradation

No roadless areas are recommended for wilderness study. Roadless areas are available for off-highway vehicle use

Facilities and trails are provided for groups such as horseback riders or mountain bikers in areas where conflicts with motorized recreation do not occur.

The allowable sale quantity of timber products is 400 million board feet (or an average annual offer of 40 million board feet per year). Approximately 354,000 acres are classified as suitable for timber production. All timber harvest cutting methods are available; clearcutting is the predominant method

Habitat is provided for a variety of wildlife species. Habitat is provided for white-tailed deer and ruffed grouse on areas suitable for timber production. Habitat for wild turkey or black bear is provided in remote, inaccessible areas.

The planning record *Alternative 4* contains a more detailed explanation of this alternative It includes, by reference, the mitigation measures incorporated into the alternative in the form of standards from the planning records *Management Area Prescriptions* and *Common Standards*.

ALTERNATIVE 5

Alternative 5 provides an uninterrupted flow of marketable goods and services. It provides a high level of timber and, as a result, habitat favorable to huntable wildlife.

Between the DEIS and FEIS, the ASQ for this alternative has been increased from 600 MMBF to 680 MMBF to provide a response to concerns that sufficient regeneration was not being accomplished given gypsy moth mortality.

The allowable sale quantity of timber products is 680 million board feet (or an average annual offer of 68 million board feet per year). Approximately 654,000 acres are classified as suitable for timber production. Clearcutting is the predominant cutting method

High value sawtimber is harvested prior to gypsy moth attack.

Lands not well-suited to timber or bear/squirrel or turkey/woodpecker habitat provide dispersed recreation. Both dispersed and developed recreation are expanded if the demand is there. System roads open for public use are available for licensed off-highway vehicles; those closed to public use may be designated for unlicensed off-highway vehicle use.

Additional camping developments are constructed at Lake Moomaw, Trout Pond and Sherando Lake. All existing and new sites provide full accessability to people with disabilities

None of the roadless areas are recommended for wilderness study

The planning record *Alternative 5* contains a more detailed explanation of this alternative. It includes, by reference, the mitigation measures incorporated into the alternative in the form of standards from the planning records *Management Area Prescriptions* and *Common Standards*.

ALTERNATIVE 6

In Alternative 6, the emphasis is on non-market goods and services. Included are wilderness recreation, fish and wildlife habitat, water recreation, and non-wilderness dispersed recreation. Eleven roadless areas (containing 87,000 acres or one-third of the acreage in the roadless area inventory) are recommended for wilderness study. Special Interest Areas are maintained or enhanced.

Between the DEIS and FEIS, the amount of wildlife habitat improvement accomplished through non-timber management practices is increased so that this alternative provides an amount of wildlife habitat comparable with the selected alternative. The management area allocation is also modified to increase the amount of lands in Management Area 4 through the inclusion of more "Special Interest Areas - Biological" including the Shenandoah Mountain Crest.

Existing developed recreation areas are managed to provide comfort and convenience for users. Accessibility is provided for people with disabilities.

Dispersed recreation emphasizes backpacking, horseback riding, mountain bicycling, and hiking. Primary emphasis is to provide primitive recreation experiences.

Existing all-terrain vehicle routes are retained.

There is no allowable sale quantity for timber products or lands classified suitable for timber production. Timber harvesting is limited to salvaging damaged stands, providing fuelwood and other miscellaneous products for traditional personal use, achieving safety objectives such as the removal of hazard trees and attaining visual objectives such as maintaining vistas.

Special habitat is provided for unique natural communities of exemplary plant and animal species including the home range of the Cow Knob Salamander.

Non-game or late-successional species not common on private lands are emphasized Bear and turkey are the preferred game species. Non-timber management practices are employed to achieve a level of wildlife benefits comparable to the Forest Service preferred alternative.

The planning record *Alternative 6* contains a more detailed explanation of this alternative It includes, by reference, the mitigation measures incorporated in the alternative in the form of standards from the planning records *Management Area Prescriptions* and *Common Standards*.

ALTERNATIVE 7

Alternative 7 allocates Forest lands to unfragmented habitat, riparian areas, habitat for bear/squirrel, habitat for turkey/woodpecker, habitat for deer/grouse. Quality hunting, fishing, hiking, and nature study are emphasized.

Between the DEIS and FEIS, the allowable sale quantity is reduced from 580 MMBF to 520 MMBF to provide a wide range of response to concerns over the amount of timber harvesting. The management area allocation is also modified to remove all of the "Special Biological Areas" from Management Area 4.

A variety of vegetation management techniques are used to achieve the objectives of providing a diversity of habitat conditions from early successional to older growth forestwide. Wildlife and vegetation management are emphasized throughout the Forest except in selected management areas.

Instead of designating biological areas, forestwide standards are used to protect threatened, endangered and sensitive species of plants and animals.

The allowable sale quantity of timber products is 520 million board feet (or an average annual offer of 52 million board feet per year). A total of 696,000 acres are classified as suitable for timber production. Although both even-aged and uneven-aged management may be used, even-aged management is favored because of the greater likelihood for successful regeneration of oak species.

Additional camping developments are constructed at Lake Moomaw, Trout Pond and Sherando Lake. All existing and new sites provide full accessability to visitors with disabilities

No roadless areas are recommended for wilderness study. Most roadless areas are managed to provide habitat for bear/squirrel.

Emphasis is placed on promoting quality hunting, fishing, hiking and nature study opportunities. Motorized recreation is confined to established roadways.

The planning record *Alternative 7* contains a more detailed explanation of this alternative. It includes, by reference, the mitigation measures incorporated in the alternative in the form of standards from the planning records *Management Area Prescriptions* and *Common Standards*.

ALTERNATIVE 8

Alternative 8 was the Forest Service preferred alternative in the DEIS. Alternative 8A has been identified as the Forest Service preferred alternative in the FEIS.

Alternative 8 places emphasis on biological values -- proposed, threatened, endangered, and sensitive species; large areas of unfragmented habitat for area-sensitive species; wildlife viewing and nature studies -- while providing multiple use.

All highly developed recreation areas are improved with additional amenities. The Elizabeth Furnace, Bolar Mountain, Sherando Lake and Trout Pond Recreation Areas are expanded. A group campground is developed on Lake Moomaw. Three horse camps are developed. Camping sites are added at Braley Pond.

Dispersed recreation emphasis is on promoting quality hiking, hunting, fishing, mountain biking and nature study opportunities.

Three roadless areas are recommended for wilderness study. Other roadless areas are managed as "Remote Highlands" to provide primitive recreation opportunities and habitat for wildlife species favoring remote areas.

Five ATV trail complexes are provided on five of the six Ranger Districts. 173 miles of system road suitable for off-highway vehicle use are managed to provide motorized recreation experiences.

The allowable sale quantity of timber products is 270 million board feet (or an average annual offer of 27 million board feet per year). Approximately 260,000 acres (one-fourth of the Forest) are classified as suitable for timber production. Both even-aged and uneven-aged management systems are used to provide a wide range of vegetation manipulation. Clearcutting is used only after site-specific, project-level analysis has determined that other silvicultural methods will not achieve the desired results. Modified shelterwood is the primary timber harvest method employed.

Wildlife is emphasized on 39 percent of the Forest through a combination of management practices including timber harvesting, prescribed burning and openings

The planning record *Alternative 8* contains a more detailed explanation of this alternative. It includes, by reference, the mitigation measures incorporated in the alternative in the form of standards from the planning records *Management Area Prescriptions* and *Common Standards*.

ALTERNATIVE 8A

Alternative 8A is the Forest Service preferred alternative. It is developed in more detail in the accompanying Revised Plan. This alternative is consistent with the program in the 1990 Resources Planning Act Assessment.

The Forest Service preferred alternative places emphasis on providing a mixture of uses, values, products and conditions designed to meet the changing needs and desires of the Forest's public. These multiple uses are provided in a manner that maintains the biological diversity and sustainability of the forest ecosystems.

Special habitat is provided for unique natural communities of exemplary plant and animal species including the home range of the Cow Knob salamander.

A variety of habitats is provided for both game and non-game animals including unfragmented habitat for area-sensitive species, old growth, late successional habitat for black bear and wild turkey, and early successional habitat for ruffed grouse and related species. This variety of habitat is provided in a manner that is consistent with the recent land use patterns that have developed on the Forest.

Highly developed recreation areas are improved with additional amenities. Fifteen new developed recreation facilities are scheduled for construction and 11 existing recreation sites are scheduled for expansion.

Dispersed recreation emphasis is on providing quality hiking, horseback riding, hunting, fishing, mountain biking, and nature study opportunities.

Three roadless areas (containing 12,000 acres) are recommended for wilderness study. Most other roadless areas are managed as Remote Highlands or Special Management Areas to provide primitive recreation opportunities and habitat for wildlife species favoring remote areas. Motorized use of traditionally open system roads continues.

Four ATV complexes are provided on four of the six ranger districts. Motorized recreation experiences are provided by 160 miles of system roads that are suitable for off-highway vehicle use.

The allowable sale quantity of timber products is 330 million board feet (or an average annual offer of 33 million board feet per year). Almost one-third of the Forest -- 348,000 acres -- is classified as suitable for timber production. Both even-aged and uneven-aged management systems are used to provide a wide range of vegetation manipulation Clearcutting is used only after site-specific, project-level analysis has determined that other silvicultural methods will not achieve the desired results. Modified shelterwood is the primary timber harvest method employed

Wildlife is emphasized on almost one-half of the Forest through a combination of management practices that includes timber harvesting, prescribed burning, and openings

The Revised Plan contains a detailed explanation of this alternative including the mitigation measures incorporated in the Forest Service preferred alternative in the form of standards

ALTERNATIVE 9

Alternative 9 provides extensive areas of unfragmented forest and a large increase in wilderness.

Between the DEIS and FEIS, the land suitable for timber production is reduced from 80,000 acres to 66,000 acres based on additional evaluation of where uneven-aged regeneration harvests could be practially applied on the Forest. The management area allocation is also modified to increase the amount of lands in Management Area 4 through the inclusion of more "Special Interest Areas - Biological".

Existing developed recreation areas are maintained. No additional highly developed sites, like Sherando Lake, are created A few additional small, relatively unimproved recreation sites are permitted where there is a clear demand for their use

Dispersed recreation emphasizes backpacking, horseback riding and hiking. Large contiguous blocks are provided for dispersed recreation and primitive camping

The Big Blue Trail, the Allegheny Trail, the Trimble Mountain Trail, and the Massanutten Mountain Trails are designated as National Recreation Trails.

Off-highway vehicle use is restricted to open roads. No all-terrain vehicle use is permitted.

All 27 roadless areas (containing more than 260,000 acres) are recommended for wilderness study.

The allowable sale quantity of timber products is 80 million board feet (or an average annual offer of 8 million board feet per year). Approximately 66,000 acres are classified as suitable for timber production. Timber harvesting is limited to uneven-aged harvest cutting methods in peripheral areas where access already exists.

Special habitat is provided for unique natural communities of exemplary plant and animal species including the home range of the Cow Knob salamander.

Habitat is provided predominantly for wildlife species favoring older vegetation and areas with little or no human intrusion.

The planning record *Alternative 9* contains a more detailed explanation of this alternative. It includes, by reference, the mitigation measures incorporated in the alternative in the form of standards from the planning records *Management Area Prescriptions* and *Common Standards*.

ALTERNATIVE 10

Alternative 10 emphasizes a mixture of goods and services that provides the highest revenue in an efficient manner. Included is a timber sale program of least-net-cost. The volume of timber produced is determined by the amount of land available for timber production that can provide a positive cash flow.

Highly developed recreation areas are improved with additional amenities. Fifteen new developed recreation facilities are scheduled for construction and 11 existing recreation sites are scheduled for expansion.

Three existing all-terrain vehicle trail complexes are retained. Some system roads are left open for off-highway vehicle use.

Two roadless areas (containing almost 3,000 acres) are recommended for wilderness study.

The allowable sale quantity of timber products is 150 million board feet (or an average annual offer of 15 million board feet). Lands classified suitable for timber production total about 120,000 acres. These lands are managed to emphasize the production of high-value forest products. Clearcutting is the predominant timber cutting method.

Forty-five percent of the Forest is managed to emphasize wildlife species with habitat needs that can be met with prescribed fire or other methods of vegetation manipulation. Vegetation manipulation through timber sales is permitted when it is the most cost-effective way of achieving wildlife habitat objectives.

The planning record *Alternative 10* contains a more detailed explanation of this alternative. It includes, by reference, the mitigation measures incorporated in the alternative in the form of standards from the planning records *Management Area Prescriptions* and *Common Standards*.

ALTERNATIVE 11

Alternative 11 is reformulated to explore changes suggested in public comments about the Draft Revised Plan and DEIS.

Special habitat is provided for unique natural communities of exemplary plant and animal species. This includes the home range of the Cow Knob salamander.

Habitat is provided primarily for game and non-game animals that favor late successional habitats including unfragmented habitat for area-sensitive species, old growth.

Additional camping developments are constructed at Lake Moomaw, Trout Pond and Sherando Lake. Existing and new sites provide full accessibility to visitors with disabilities.

Off-highway vehicle use is restricted to open roads. No all-terrain vehicle use is permitted.

Eleven roadless areas (containing more than 115,000 acres or 44 percent of the total acreage in the roadless area inventory) are recommended for wilderness study.

The allowable sale quantity of timber products is 210 million board feet (or an average annual offer of 21 million board feet). Approximately 280,000 acres are classified as suitable for timber production. Timber cutting is limited to modified shelterwood, two-stage shelterwood and uneven-aged methods that take place within one-fourth to one-half mile of open system roads.

There is no road construction to access timber harvest units. All timber harvesting is accomplished with temporary roads and skid trails that are permanently closed and revegetated following timber harvesting activities.

The planning record *Alternative 11* contains a more detailed explanation of this alternative. It includes, by reference, the mitigation measures incorporated in the alternative in the form of standards from the planning records *Management Area Prescriptions* and *Common Standards*.

ALTERNATIVE 12

Alternative 12 provides a traditional range of goods and services including timber, recreation, minerals, existing wilderness, range, and wildlife habitat. The production of wood, motorized recreation opportunities, and wildlife habitat are particularly emphasized.

Between the DEIS and FEIS, the ASQ for this alternative has been reduced from 500 MMBF to 450 MMBF to provide a wide range of response to concerns over the amount of timber harvesting. The lands suitable for timber production have been increased to 595,000 acres. Also the mixture of regeneration harvest methods has been changed to clearcutting on 1,250 acres, modified shelterwood on 1,400 acres, and two-stage shelterwood on 700 acres.

Highly developed recreation areas are improved with additional amenities. Fifteen new developed recreation facilities are scheduled for construction and 11 existing recreation sites are scheduled for expansion.

A variety of nonmotorized recreation experiences are provided and are served by the existing trail system. Nine off-highway vehicle trail complexes can be constructed if demand warrants.

None of the roadless areas are recommended for wilderness study.

High levels of motorized and non-motorized recreation opportunities are provided. Backpacking, horseback riding, mountain bicycling and hiking are emphasized as dispersed recreation opportunities. Nine off-highway vehicle trail systems are provided.

The allowable sale quantity of timber products is 450 million board feet (or an average annual offer of 45 million board feet). Approximately 595,000 acres are classified as suitable for timber production. Clearcutting and modified shelterwood are the predominant timber harvest methods.

Approximately 60 percent of the Forest is managed to emphasize wildlife habitat. A variety of vegetation manipulation techniques are used to achieve wildlife habitat management objectives.

The planning record *Alternative 12* contains a more detailed explanation of this alternative. It includes, by reference, the mitigation measures incorporated in the alternative in the form of standards from the planning records *Management Area Prescriptions* and *Common Standards*.

ALTERNATIVE 13

Based on public comments about the Draft Revised Plan and the DEIS, Alternative 13 is reformulated for the purpose of exploring suggested changes.

Special habitat is provided for unique natural communities of exemplary plant and animal species including the home range of the Cow Knob salamander.

Habitat is provided primarily for game and non-game animals that favor late successional habitats including unfragmented habitat for area-sensitive species, old growth. Migration corridors are provided for the movement of species whose movement can be restricted by road construction or forest openings.

Additional camping developments are constructed at Lake Moomaw, Trout Pond, and Sherando Lake. Existing and new sites provide full accessibility to visitors with disabilities.

Off-highway vehicle use is restricted to open roads. No all-terrain vehicle use is permitted

Twenty-two roadless areas (containing almost 213,000 acres or 82 percent of the total acreage in the roadless area inventory) are recommended for wilderness study. The remaining five roadless areas are allocated to a management area that is specifically designed to retain their roadless character.

The allowable sale quantity of timber products is 150 million board feet (or an average annual offer of 15 million board feet). Approximately 185,000 acres are suitable for timber production. Timber harvesting is limited to two-stage shelterwood and uneven-aged timber harvest methods within one-fourth to one-half mile of open system roads.

No new roads are constructed for the purpose of accessing timber harvest units. All timber harvesting is acomplished with temporary roads and skid trails that are permanently closed and revegetated following timber harvesting activities.

The planning record *Alternative 13* contains a more detailed explanation of this alternative. It includes, by reference, the mitigation measures incorporated in the alternative in the form of standards from the planning records *Management Area Prescriptions* and *Common Standards*.

ALTERNATIVE 14

Under Alternative 14, the Forest is managed to (1) provide a mixture of emphases based on local issues and conditions, (2) provide goods and services to local constituents, (3) maintain natural values on large portions of the Forest (including a moderate increase in wilderness), and (4) minimize value loss and vegetation impacts caused by the spread of gypsy moth defoliation and mortality.

All existing and new developed recreation sites provide full accessability to people with disabilities. Additional camping developments are constructed at Lake Moomaw, Trout Pond and Sherando Lake. Small campgrounds are constructed at Braley Pond, Jerry's Run, and at four equestrian-use sites. Larger campgrounds are constructed at Elizabeth Furnace, a new loop at Longdale, and an equestrian loop at Bear Wallow. Group camping areas are constructed at two Lake Moomaw sites: McClintic Point and Morris Hill. Greenwood Point, a primitive boat-launch site on the lake, is expanded as well. The Hidden Valley Recreation Area is enhanced. Increased parking capacity and an interpretive center are added to Crabtree Falls.

The existing trail system is maintained and/or reconstructed. New trails are constructed to create loops and other opportunities. Efforts concentrate on completing the Alleghany and Massanutten West trails and an interconnecting trail between the Big Blue and Alleghany trails.

Existing all-terrain vehicle trail complexes on the Pedlar, Lee, and Dry River ranger districts are used to provide off-highway vehicle opportunities.

Three roadless areas are recommended for wilderness study. Most of the other roadless areas are managed as "Remote Highlands" to provide primitive recreation opportunities and habitat for wildlife species favoring remote areas.

The allowable sale quantity of timber products is 350 million board feet (or an average annual offer of 35 million board feet). 350,000 acres are suitable for timber production. All even-aged timber harvest methods are available. Uneven-aged timber harvest methods may be practiced in sensitive viewsheds and areas with high dispersed recreation use.

Wildlife management is for both game and non-game species, for both consumptive and non-consumptive use.

The planning record *Alternative 14* contains a more detailed explanation of this alternative. It includes, by reference, the mitigation measures incorporated into the alternative in the form of standards from the planning records *Management Area Prescriptions* and *Common Standards*.

MANAGEMENT AREAS

Each alternative examined in detail in the revision documents has an associated map displaying the allocation of different portions of the Forest to different management areas. By definition, **management areas** are **"areas of the Forest with similar management objectives where compatible management prescriptions are applied."**

The 1986 Plan defined management areas under a different concept than is being used in the Revised Plan. Generally, the 1986 Plan defined a number of small and specific management areas, but relegated most of the Forest to general management in Management Areas 14 (General Forest Area), 15 (Low Productivity Land), 16 (Steep Lands). Within these areas, it was difficult to determine where different emphases were applied.

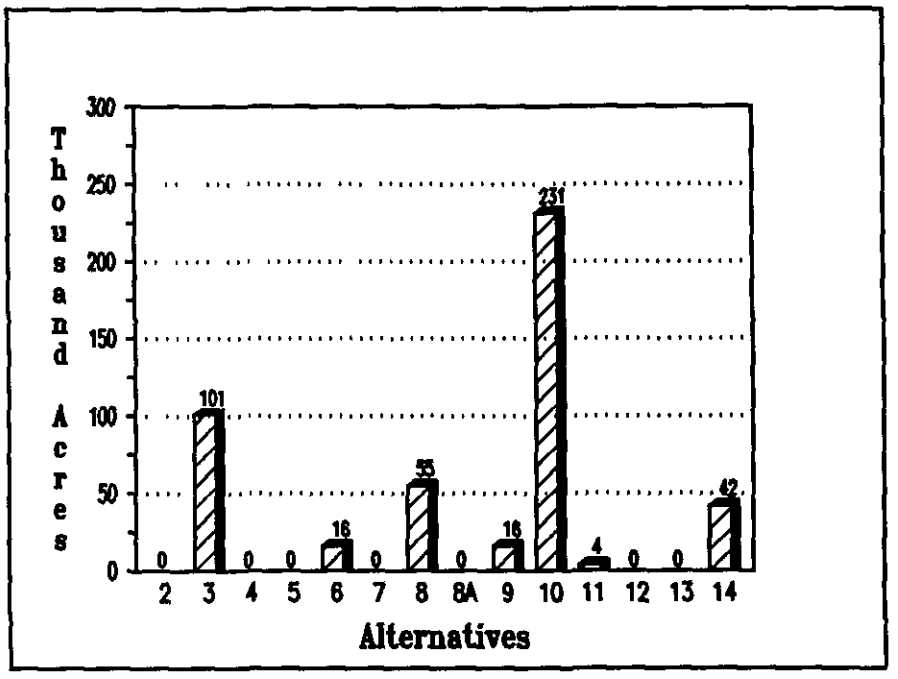
Management areas in the Revised Plan operate under a "zone" concept. This zone concept gives area-specific direction for the entire Forest. Twenty-two management areas -- or zones -- carry forward the management direction set by the alternatives. No alternative allocates lands to all 22 management areas. Instead, management area allocations are governed by the goals of a particular alternative.

A summary of the management area prescriptions is contained in Appendix B of this document. A complete description of the management areas and management area prescriptions is contained in the process record *MANAGEMENT AREA PRESCRIPTIONS* on file in the Supervisor's Office.

MANAGEMENT AREA 1

Minimal Level Management: This management area contains portions of the Forest which are either (1) unsuitable for timber production and where specific management activities are not needed to achieve increased multiple use objectives, or (2) are managed at a minimal level to reduce federal expenditures and to provide primitive, dispersed recreation opportunities.

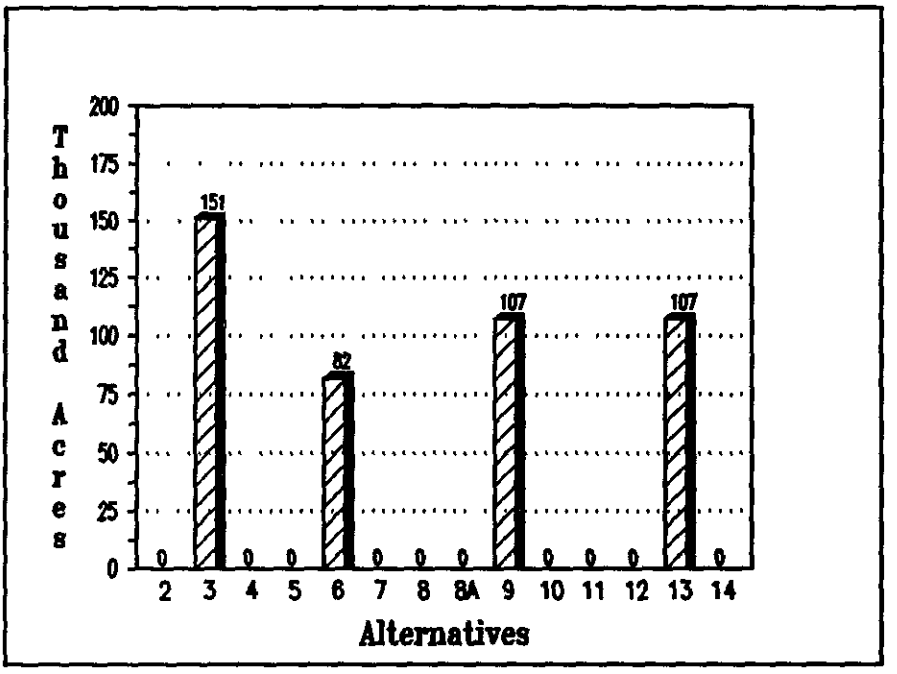
Graph 2-1.
Thousands of Acres in Management Area 1 by Alternative



MANAGEMENT AREA 2

Migration Corridors: This management area is designed to avoid fragmentation of habitat. It calls for migration corridors for wildlife species that require late successional vegetation and habitat that is unfragmented by roads and human-caused openings in the forest canopy.

Graph 2-2.
Thousands of Acres in Management Area 2 by Alternative*

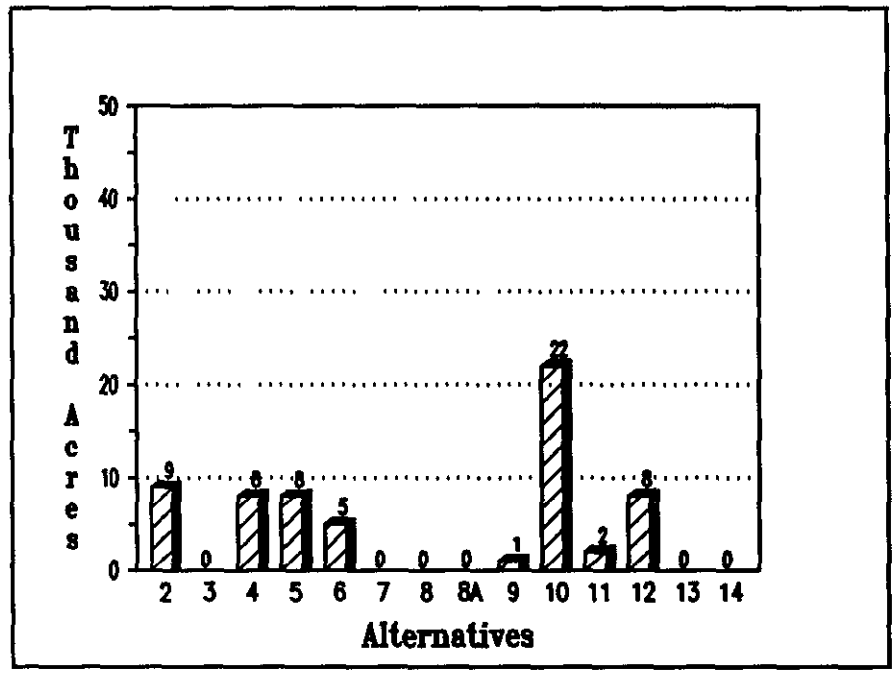


*Although specific areas identified for migration areas were not identified in all alternatives, acreages associated with management areas 4, 8, and 9 will provide this opportunity. These areas occur in all alternatives.

MANAGEMENT AREA 3

Sensitive Watersheds/Muncipal Watersheds: This management area contains (1) *an area on the Forest where the watershed is in a degraded hydrologic* condition and requires special protection, and/or (2) where municipal watersheds receive special protection.

Graph 2-3.
Thousands of Acres In Management Area 3 by Alternative*

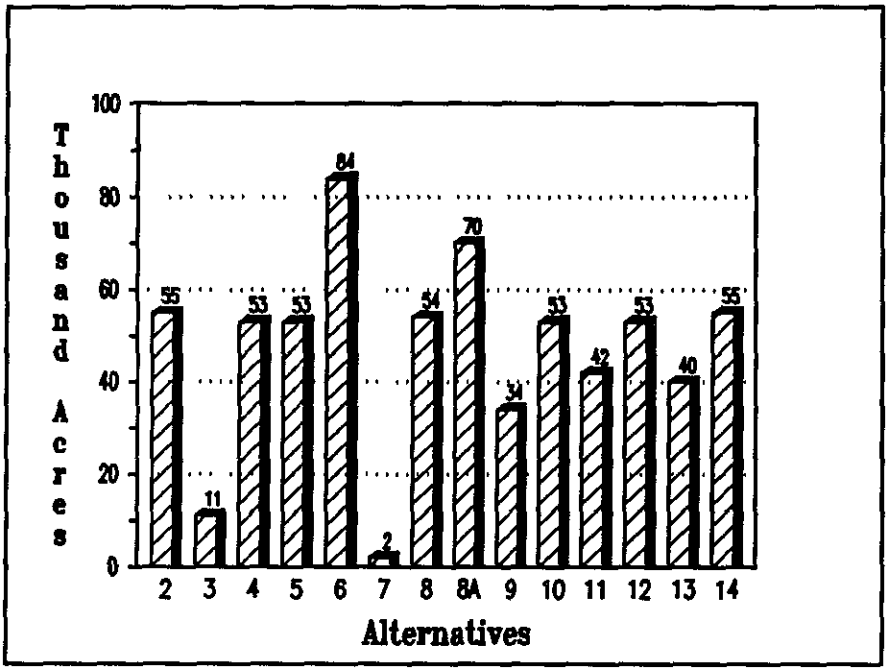


*While not specifically called "Sensitive Watersheds", areas identified as such in other alternatives are either allocated to management areas affording the same level of protection as management area 3 would provide or have standards to protect and enhance them.

MANAGEMENT AREA 4

Special Interest Areas: This management area contains lands requiring special management because of biologic, historic, or geologic values.

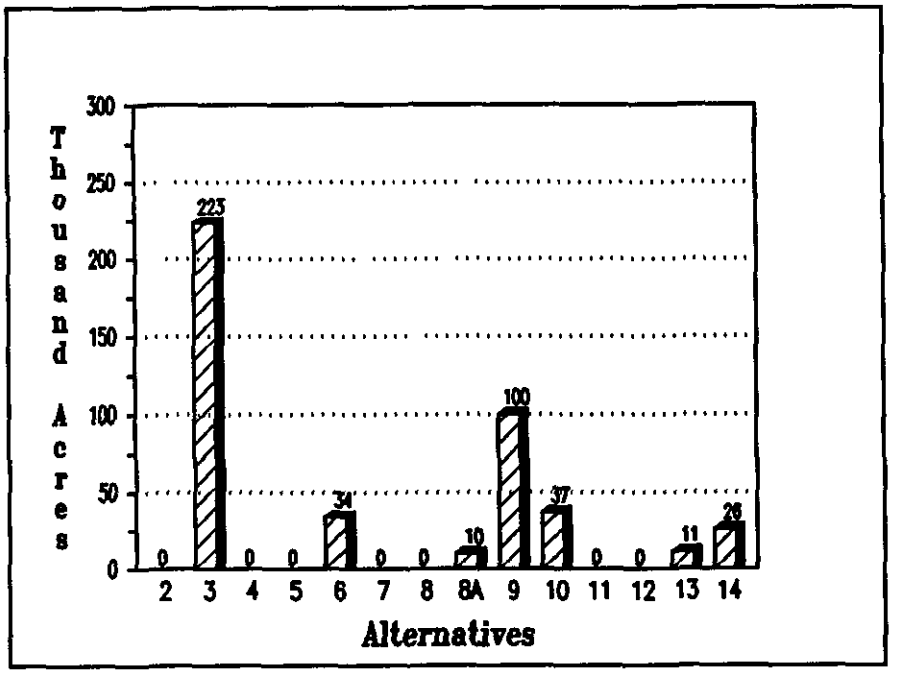
Graph 2-4.
Thousands of Acres in Management Area 4 by Alternative



MANAGEMENT AREA 5

Sensitive Viewsheds: This management area contains portions of the Forest that require protection of high scenic quality. The area is generally maintained in a natural condition by allowing physical and biological processes to operate with minimal human intervention. Resource management activities are limited to those uses that do not affect the existing scenic attributes.

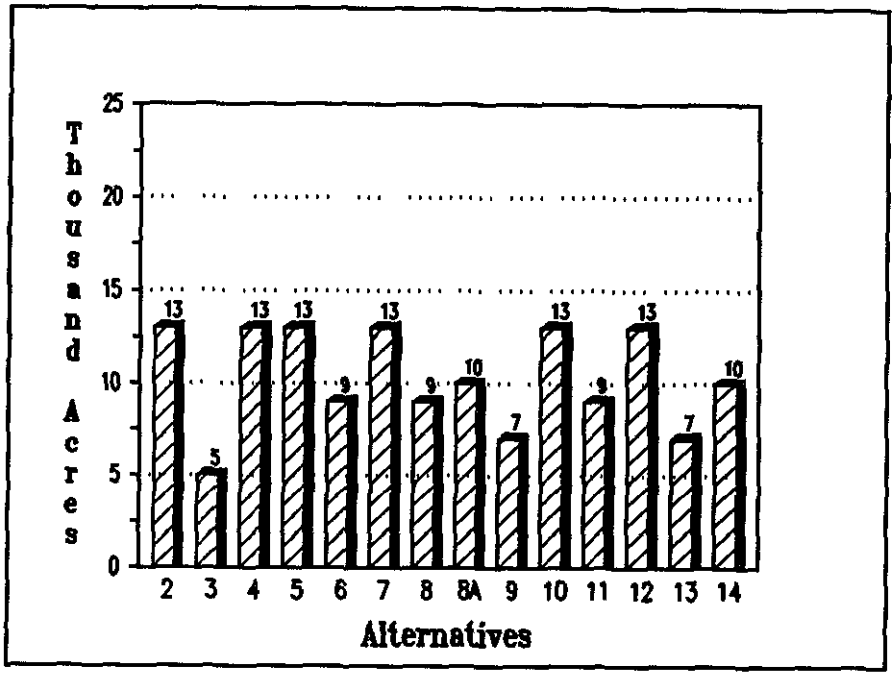
Graph 2-5.
Thousands of Acres in Management Area 5 by Alternative



MANAGEMENT AREA 6

The Appalachian Trail: This management area contains approximately 58 miles of the Appalachian National Scenic Trail on the Pedlar Ranger District and the land mapped as the foreground zone. This management area provides for the protection, management, development, and use of the Appalachian Trail in accordance with the National Trails System Act (P.L. 90-543) and is carried out through the Cooperative Management System as defined in the Appalachian Trail Comprehensive Plan. The trail is administered in cooperation with the Appalachian Trail Conference and three Appalachian Trail clubs: Natural Bridge, Old Dominion, and Tidewater.

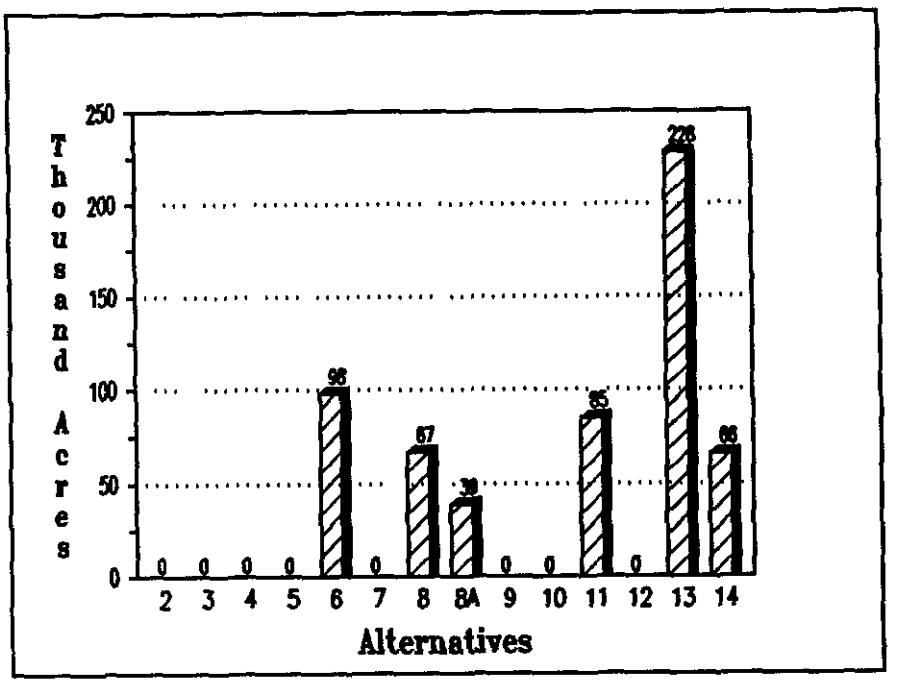
Graph 2-6.
Thousands of Acres in Management Area 6 by Alternative



MANAGEMENT AREA 7

Scenic Corridors/Highland Scenic Tour: This management area contains portions of the Forest that are visible from sensitive viewing points and from sensitive roads, trails, or waterways. This management area also contains the Highlands Scenic Tour in Alternatives 8 and 8A. Within this management area, lands are managed to preserve and, if necessary, enhance the scenic resources of the Forest.

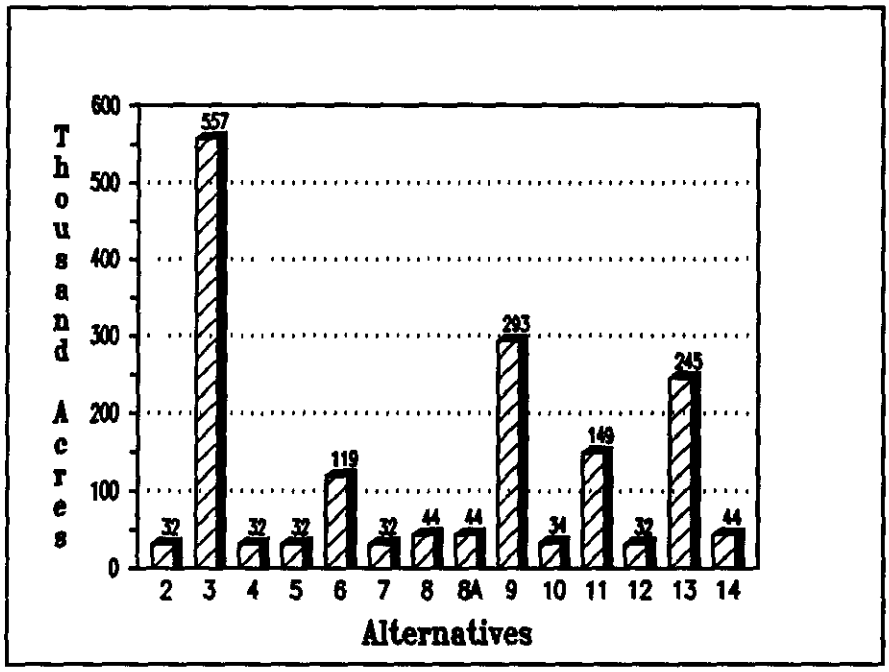
Graph 2-7.
Thousands of Acres in Management Area 7 by Alternative



MANAGEMENT AREA 8

Wilderness & Wilderness Study Areas: This management area contains the existing wildernesses on the Forest and any roadless areas that are recommended for wilderness study designation. Lands within this management area are administered to maintain or achieve a natural state. The area is generally maintained in a natural condition by allowing physical and biological processes to operate without human intervention. Activities are integrated in such a way that current human use leaves only limited and site-specific evidence.

Graph 2-8.
Thousands of Acres in Management Area 8 by Alternative

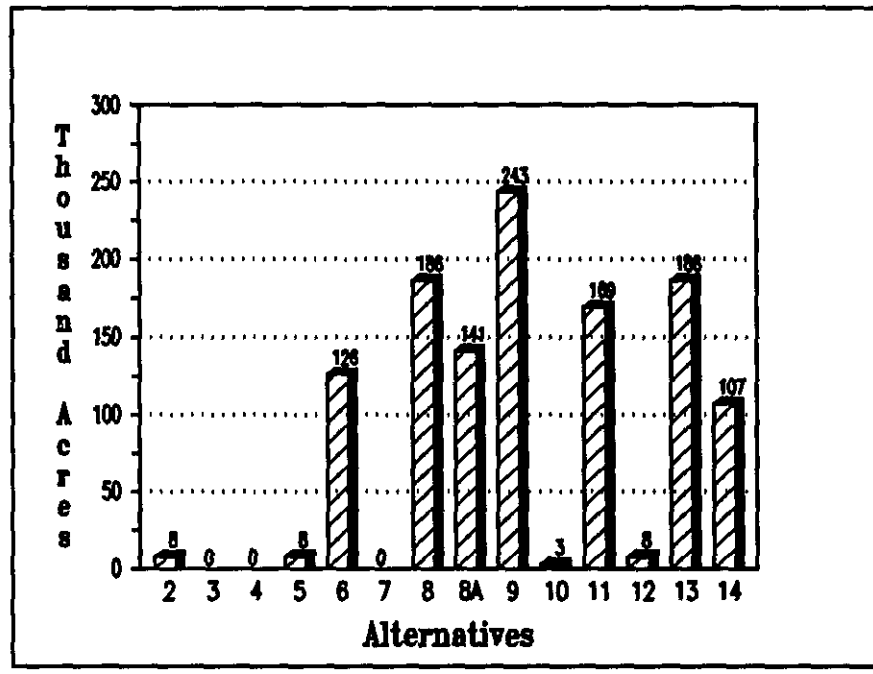


MANAGEMENT AREA 9

Back Country/Remote Highlands: This management area contains portions of the Forest that are managed to provide older vegetation in remote and isolated areas where recreationists can obtain a degree of solitude and the environment can be maintained in a near-natural state with minimum intervention.

These areas are generally maintained in a near-natural condition by allowing physical and biological processes to operate with minimal intervention. All resource management activities are integrated in such a way that current human use leaves only limited and site-specific evidence of passing.

Graph 2-9.
Thousands of Acres in Management Area 9 by Alternative

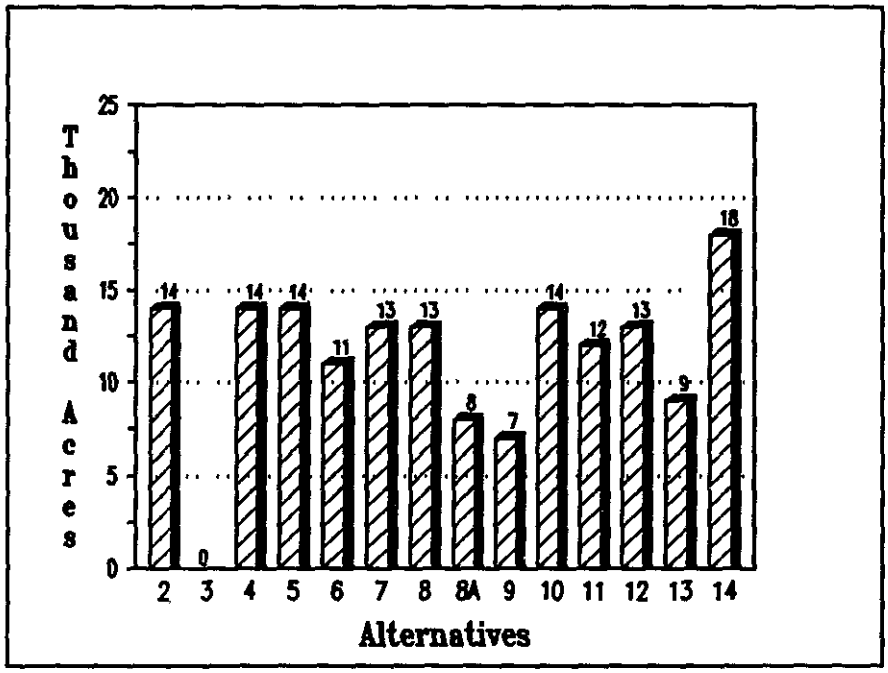


MANAGEMENT AREA 10

Scenic/Recreational Rivers: This management area contains portions of rivers eligible for the National Wild and Scenic River System under scenic or recreational river designation The eligible portions of these rivers and a one-quarter mile corridor on each side of the rivers are managed to meet the requirements of the Wild and Scenic Rivers Act of 1968.

The one river segment that qualifies for wild river designation -- the St. Mary's River -- lies within the St. Mary's Wilderness. There, **Management Area 8** provides direction that protects the qualifying characteristics of the river.

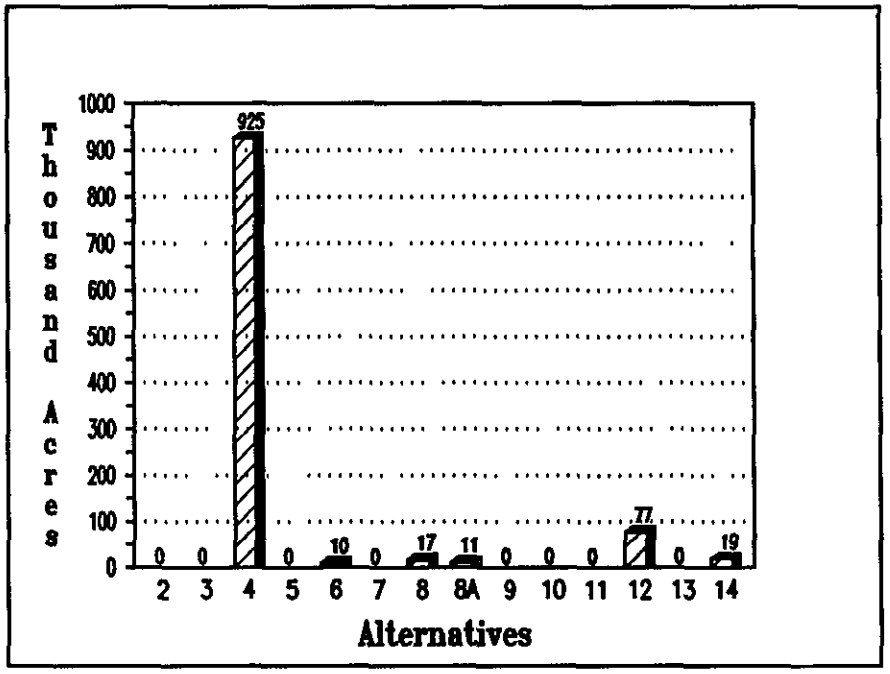
Graph 2-10.
Thousands of Acres in Management Area 10 by Alternative



MANAGEMENT AREA 11

All-Terrain/Off Highway Routes: This management area contains portions of the Forest that provide a system of legal roads and/or trails for the off-highway (OHV) and all-terrain vehicle (ATV) user.

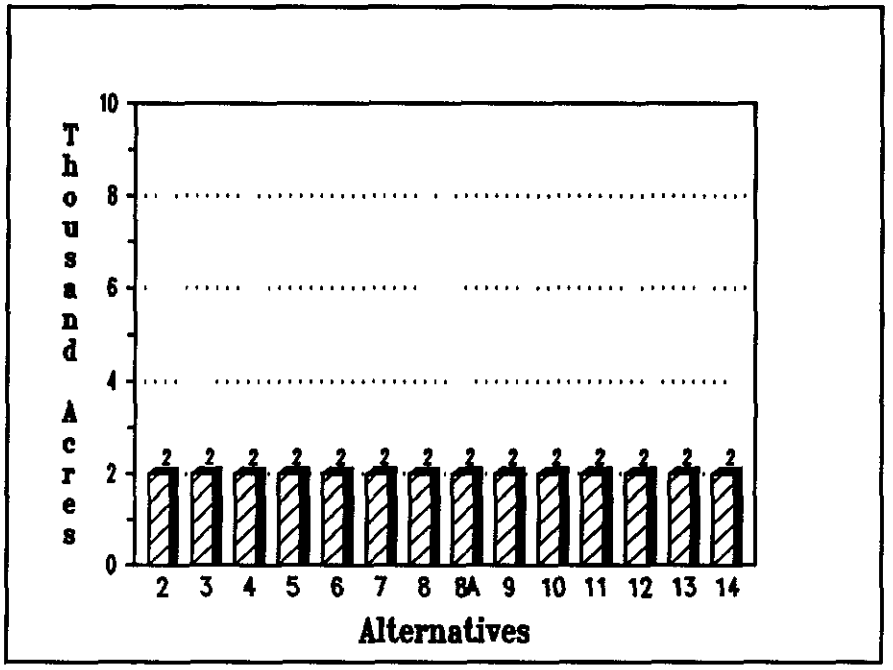
Graph 2-11.
Thousands of Acres In Management Area 11 by Alternative



MANAGEMENT AREA 12

Developed Recreation Areas: This management area contains most of the existing and future developed recreation sites on the Forest

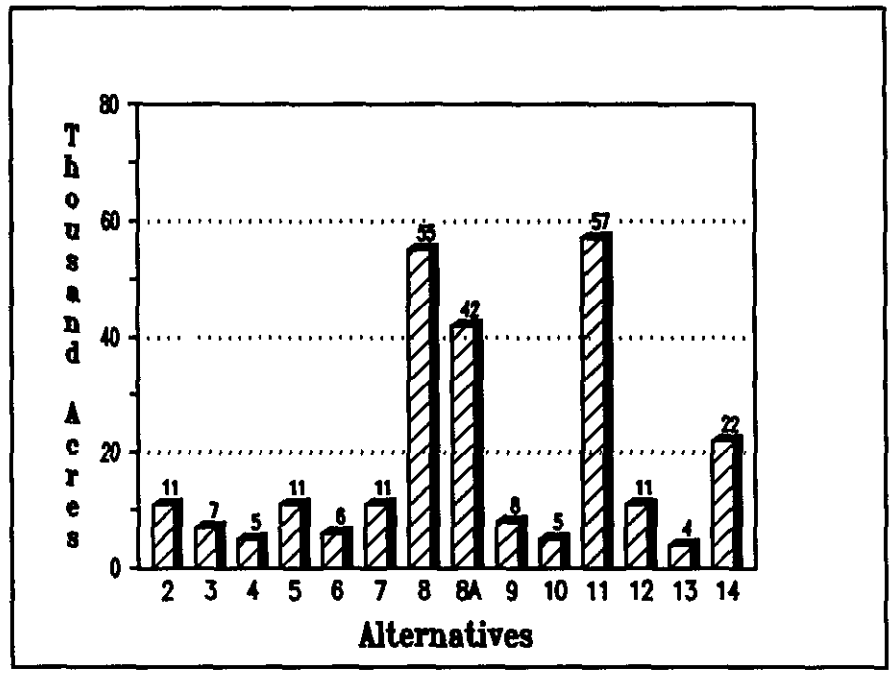
Graph 2-12.
Thousands of Acres In Management Area 12 by Alternative



MANAGEMENT AREA 13

Dispersed Recreation Areas: This management area contains portions of the Forest where there is heavy dispersed recreation use. These areas are managed to provide a variety of dispersed recreation opportunities and experiences, to enhance and interpret the unique natural resources of the area, to develop and administer a trail system that supports the demand, and to provide the facilities necessary to prevent degradation of the natural and aesthetic resources of the area.

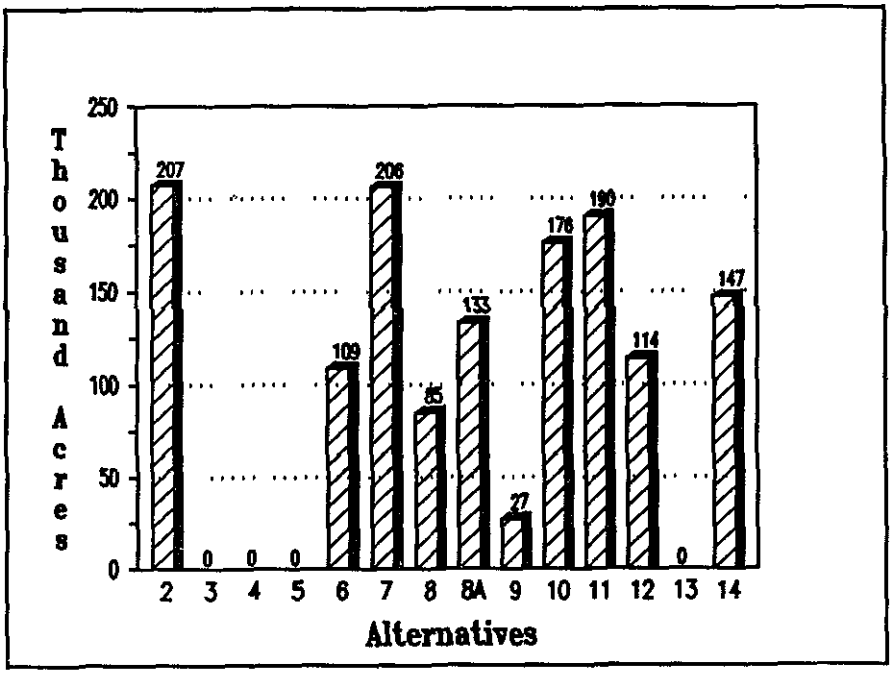
Graph 2-13.
Thousands of Acres in Management Area 13 by Alternative



MANAGEMENT AREA 14

Remote Habitats for Wildlife: This management area contains portions of the Forest that are managed to maintain or enhance wildlife habitat with older trees, a continuing supply of hard mast, and isolation from disturbance for species such as black bear, gray squirrel and pileated woodpeckers.

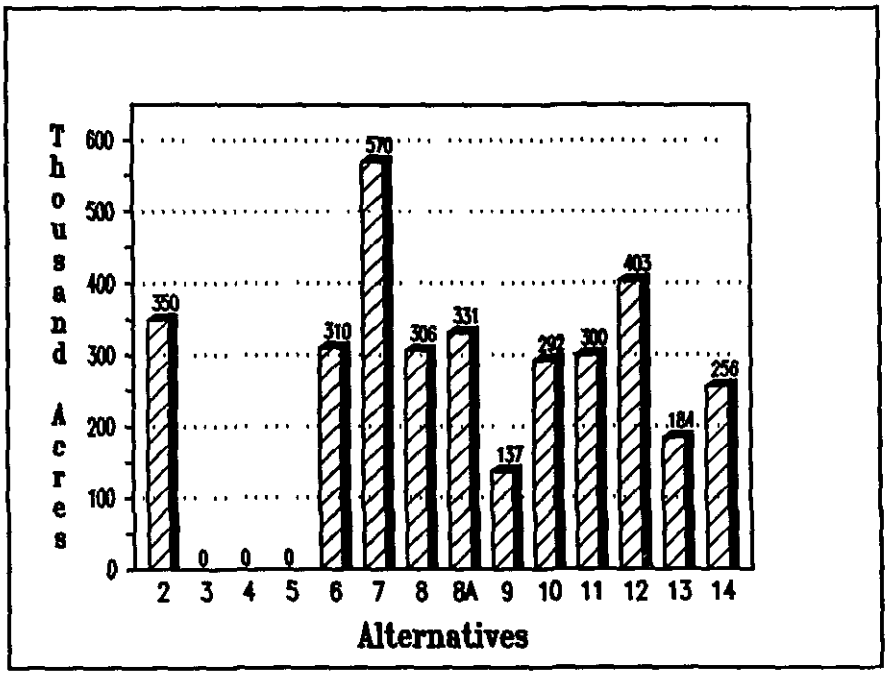
Graph 2-14.
Thousands of Acres in Management Area 14 by Alternative



MANAGEMENT AREA 15

Mosaics of Wildlife Habitats with Freedom from Continued Disturbance. This management area contains portions of the Forest that are managed to maintain or enhance habitat for wildlife – such as wild turkey, squirrel and pileated woodpeckers – favoring a more mature forest environment with small herbaceous clearings and freedom from disturbance during nesting and brood rearing seasons Vegetation characteristics and human activities are managed to provide high quality habitat for these species. Development of quality habitat would receive the highest consideration in relation to associated resources.

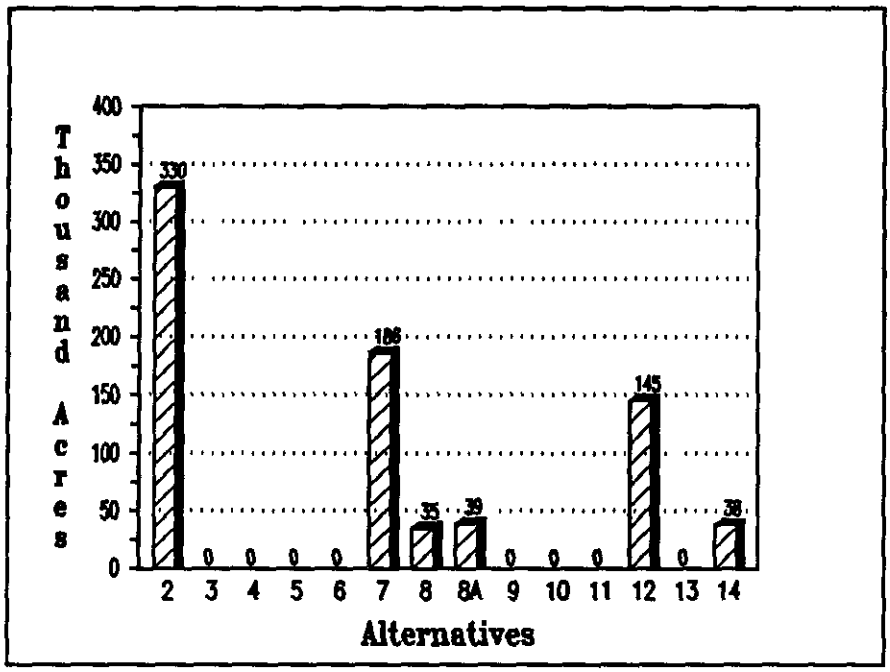
Graph 2-15.
Thousands of Acres in Management Area 15 by Alternative



MANAGEMENT AREA 16

Early Successional Forested Habitats for Wildlife: This management area contains portions of the Forest that are managed to maintain or enhance habitat for wildlife species that prefer early successional habitats, including white-tailed deer and ruffed grouse.

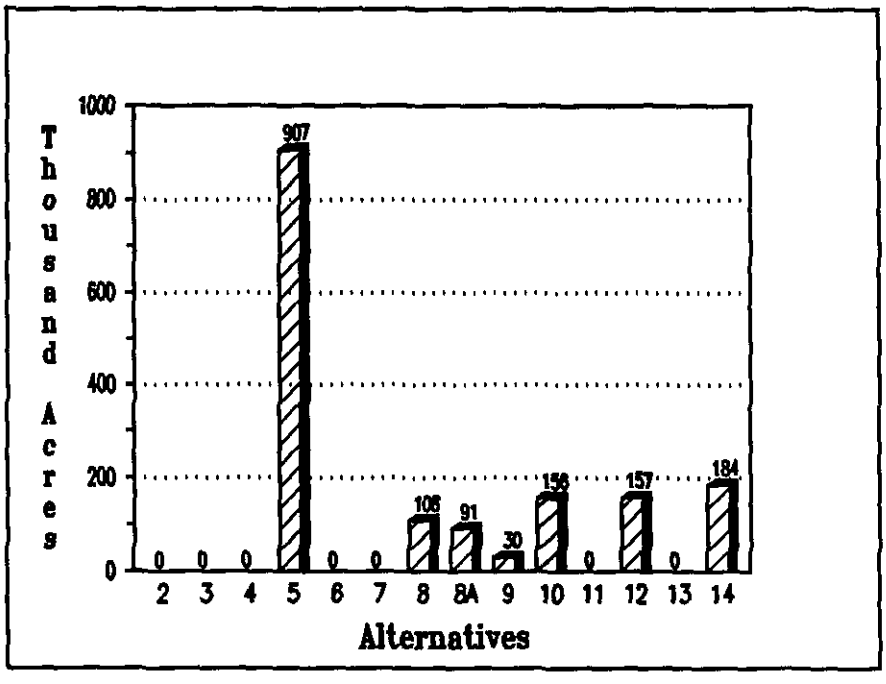
Graph 2-16.
Thousands of Acres in Management Area 16 by Alternative



MANAGEMENT AREA 17

Timber Emphasis: This management prescription contains portions of the Forest that are intensively managed for timber using either even-aged or uneven-aged timber cutting methods. Lands within this management area provide a range of timber products in as efficient and economical a manner as is consistent with multiple-use management.

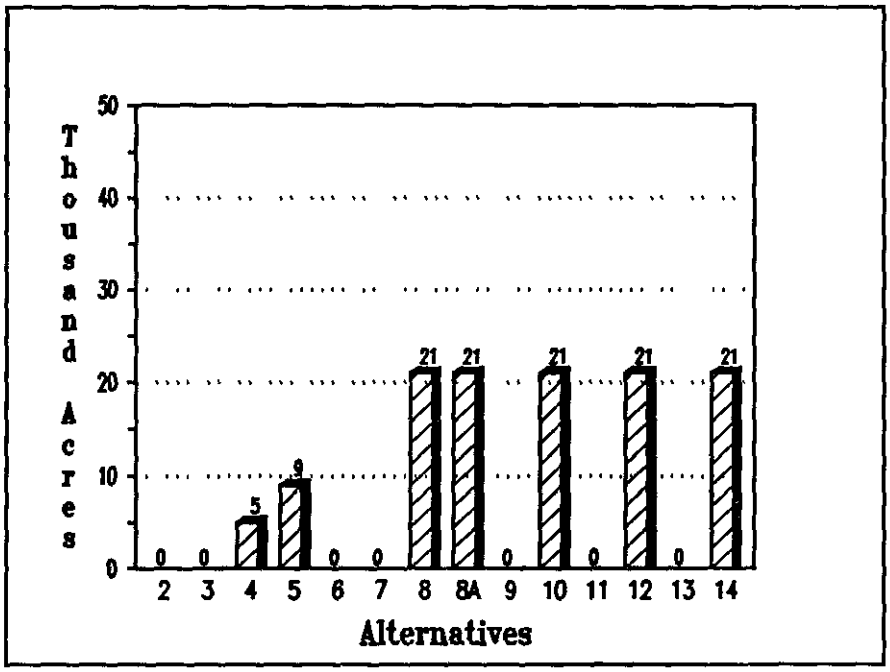
Graph 2-17.
Thousands of Acres in Management Area 17 by Alternative



MANAGEMENT AREA 18

Riparian Areas with Ecological Widths: This management area contains those riparian areas which are managed for multiple uses while providing the desired future condition of the riparian areas. On-the-ground ecological conditions determine the width of individual riparian areas.

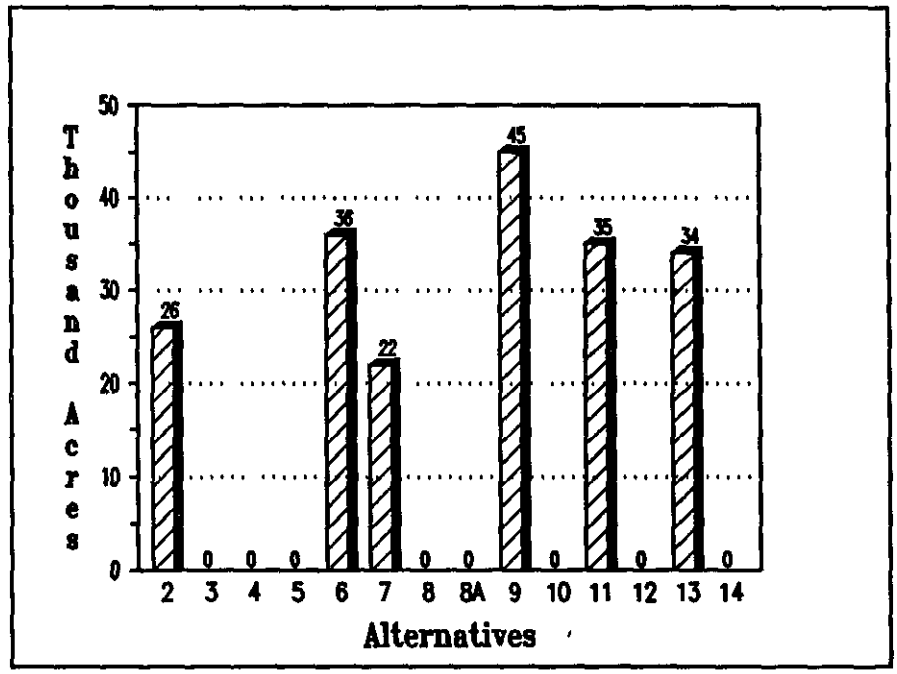
Graph 2-18.
Thousands of Acres in Management Area 18 by Alternative



MANAGEMENT AREA 19

Riparian Areas with Set Widths: This management area contains those riparian areas which are unsuitable for timber production and are managed for multiple-use objectives. Set distances from streams determine the width of individual riparian areas.

Graph 2-19.
Thousands of Acres in Management Area 19 by Alternative*

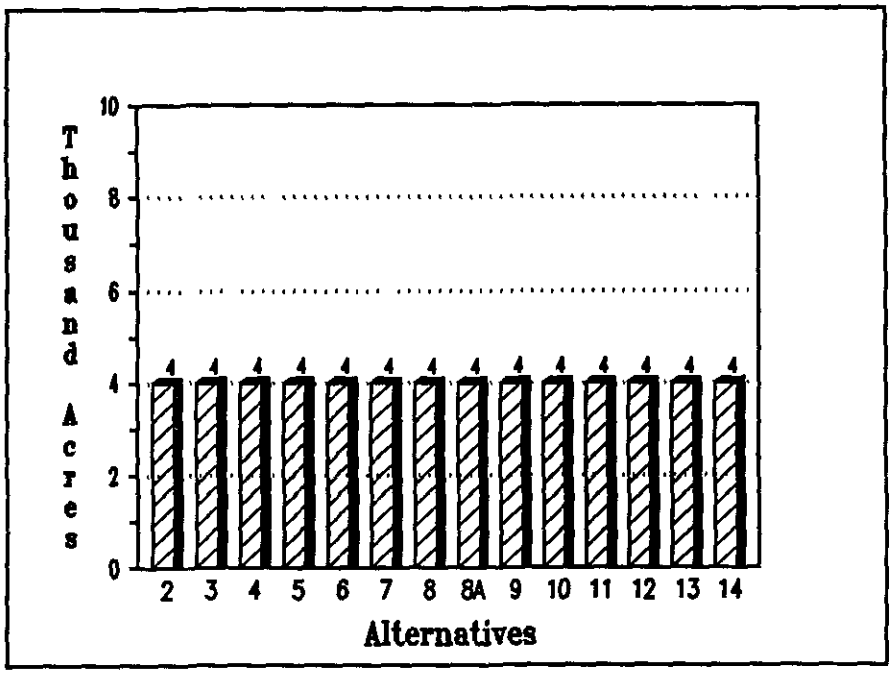


*Riparian areas in Alternative 3 are not included in riparian management areas, but are provided full protection in other management areas.

MANAGEMENT AREA 20

Administrative Sites, Utility Corridors and Communication Sites: This management area contains the administrative sites, utility corridors, and communication sites on the Forest.

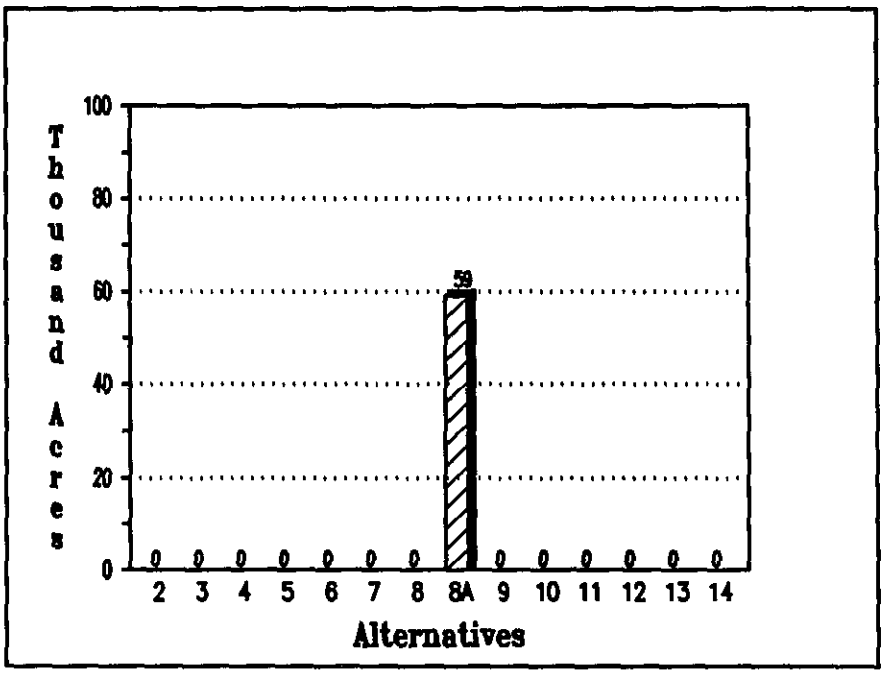
Graph 2-20.
Thousands of Acres in Management Area 20 by Alternative



MANAGEMENT AREA 21

Special Management Areas: This management area contains the Big Schloss, Laurel Fork, Little River and Mount Pleasant "Special Management Areas". These SMAs are managed to provide a variety of wildlife and recreation values.

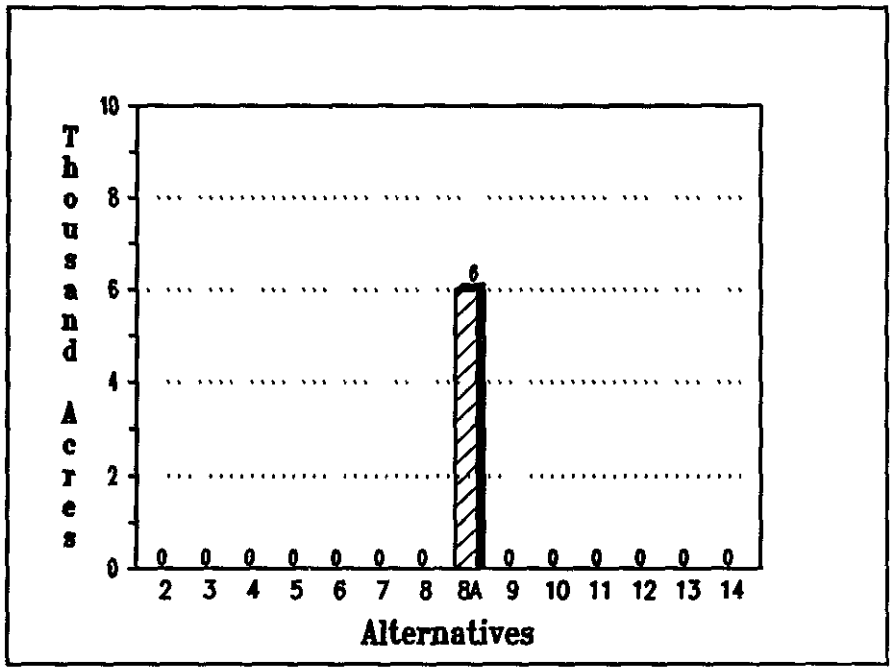
Graph 2-21.
Thousands of Acres in Management Area 21 by Alternative



MANAGEMENT AREA 22

Small Game and Watchable Wildlife: This management area contains portions of the Forest that are managed intensively for a variety of wildlife species with each area focusing on a theme such as wildlife viewing, nature study, small game management, or combinations thereof. Associated with this theme is a high level of dispersed recreation use.

Graph 2-22.
Thousands of Acres in Management Area 22 by Alternative



COMPARISONS

Since this FEIS serves as both a NFMA and a NEPA document, the information used to compare the alternatives is not limited to environmental effects. Much of the information used to compare the alternatives is contained in Chapter 3 of this document. Where there is additional information in other portions of this document (the appendices), a reference is included in the discussion. Some of the information, however, has been extracted directly from process papers on file in the Forest Supervisors Office.

This portion of Chapter 2 concentrates on those factors with measurable differences among the alternatives. These factors are presented in bar-graph or table format to facilitate comparison; they are organized under the issue they address.

This section of Chapter 2 is organized to display how the alternatives address the issues and related concerns raised in comments to the DEIS. The issues are discussed in more detail in Appendix A. Concerns raised in comments to the DEIS are discussed in more detail in Appendix I.

ISSUE 1: BIODIVERSITY

This issue deals with (1) concerns over the NFMA requirements for diversity, (2) old growth, (3) fragmentation, (4) riparian areas, (5) management indicators, (6) areas with unique biological, historic or geologic values, including threatened, endangered and sensitive species, (7) natural values of the GWNF, (8) conversion, (9) late successional species/habitat, and (10) special interest research natural areas. The ID Team identified the following factors which varied appreciably between alternatives and form a basis for comparing how the alternatives respond to this issue. Additional disclosure is contained in Chapter 3 under "Riparian Areas" and "Wildlife".

Old Growth

Scientifically definitive characteristics of old growth for the ecotypes on the Forest are lacking and not readily available. An analysis of potential old growth was completed, based on current information. The ID team believes this information reflects the relative comparison of alternatives with enough reliability to make a reasoned choice.

Table 2-1 displays the amount of land available for potential old growth conditions in thousands of acres. Lands available for potential development of old growth conditions are defined as forested lands in those management areas or portions of management areas that are designated as unsuitable for timber production.

Table 2-1.
Thousands of Acres of Old Growth In Which Timber Production Is Not Allowed

Alternative	Current	After 10 Years	After 50 Years
2	180	224	613
3	180	256	737
4	180	228	590
5	180	216	537
6	180	256	737
7	180	186	515
8	180	223	636
8A	180	225	614
9	180	200	681
10	180	238	647
11	180	162	611
12	180	223	572
13	180	204	651
14	180	229	622

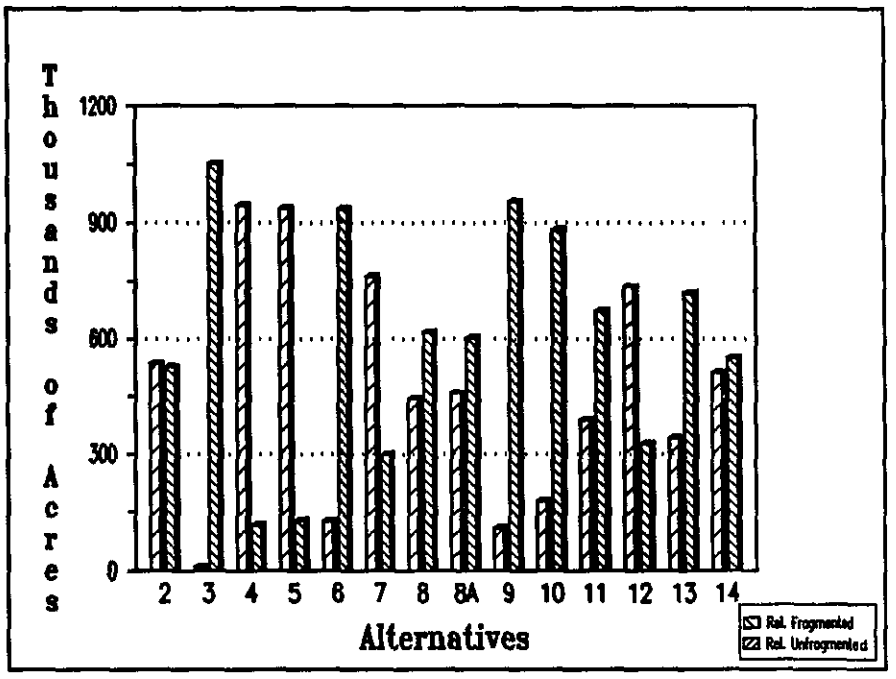
Fragmentation

Graph 2-23 contains a display of the acreage that represents a comparison by alternative of "relatively fragmented" and "relatively unfragmented" habitat.

"Relatively unfragmented" habitat is defined by those management areas or portions of management areas that are unsuitable for timber production and have a management policy that precludes road construction or public vehicular access.

"Relatively fragmented" habitat is defined by those management areas or portions of management areas that are either suitable for timber production or include a desired future condition that encourages public vehicular access.

Graph 2-23.
Thousands of Acres of "Relatively Fragmented" and "Relatively Unfragmented" Habitat by Alternative



Riparian Areas

Table 2-2 summarizes the different approaches to the management of riparian areas incorporated into alternatives.

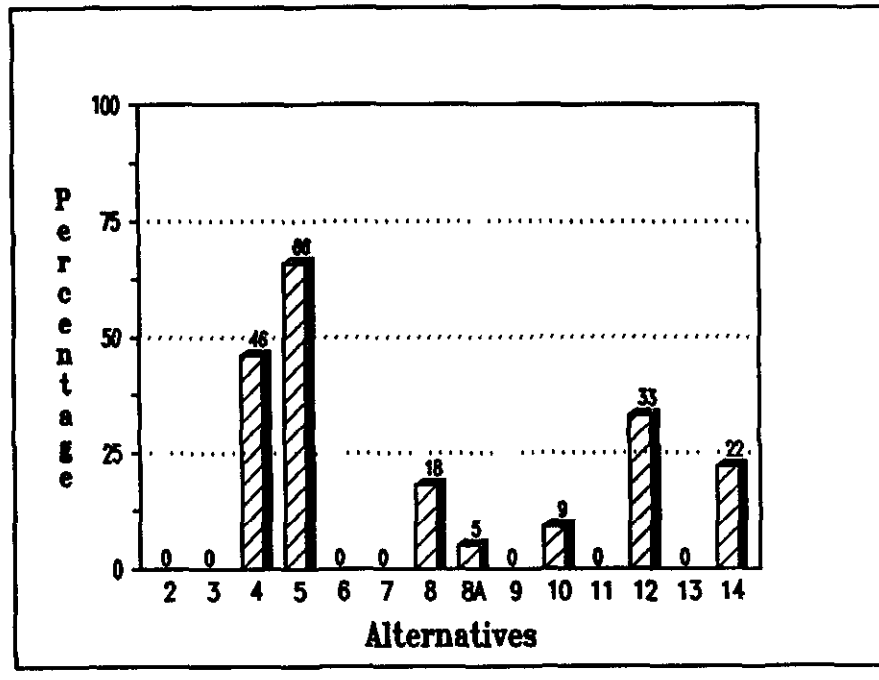
Table 2-2.
Management of Riparian Areas by Alternatives

Alternatives	Type of Management
2, 6, 11 and 13	Current Management: 100 foot no-cut zone on perennial streams, with a 200-foot no-cut zone on featured brook trout streams.
4 & 5	Mitigation Approach: State Best Management Practices.
7, 8, 8A[1], 10, 12 and 14	Resource Approach: Management activities (including timber harvesting) only if it leads to the desired future condition.
3 and 9	Natural Processes Approach: Limited hands-on management.

[1]Forest Service preferred alternative.

Graph 2-24 displays the percent of riparian areas suitable for timber production.

Graph 2-24.
Riparian Areas Suitable for Timber Production



Management Indicator Species

The ID Team identified three management indicator species where future habitat is predicted. Table 2-3 displays the relative carrying capacity for white-tailed deer, black bear and wild turkey.

Table 2-3.
Carrying Capacity[1] of Habitat for Deer, Bear, and Turkey

Alternative	Bear	Turkey	Deer
Maximum Wildlife Benchmark	1,900	29,000	73,500
2	1,300	16,600	40,300
3	1,500	15,600	26,600
4	700	8,600	30,800
5	900	14,900	60,700
6	1,500	21,600	46,400
7	1,400	24,200	64,100
8	1,400	18,900	41,400
8A[2]	1,400	19,800	46,400
9	1,500	16,200	28,600
10	1,400	16,100	34,200
11	1,400	18,900	38,000
12	1,200	19,300	56,600
13	1,400	17,500	33,100
14	1,300	18,200	46,600

[1]Carrying capacity means the number of animals the Forest can support with the habitat provided.
[2]Forest Service preferred alternative.

ISSUE 2: BELOW-COST TIMBER SALES

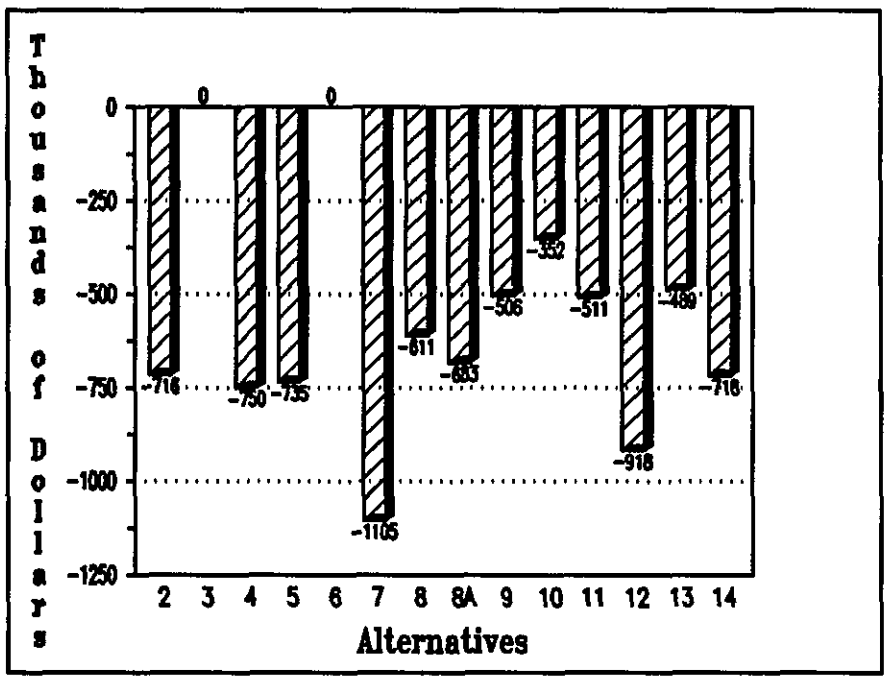
This issue deals with (1) an acknowledgement that the Forest is below-cost, (2) opposition to below-cost sales, (3) multiple use benefits from timber sales, (4) compliance with USDA policy on below-cost timber sale programs, (5) effects of the timber program on the local economy and the local timber market, (6) suitable acres and (7) allowable sale quantity. The ID Team identified the following factors which varied appreciably between alternatives and form a basis for comparing how the alternatives respond to this issue. Additional disclosure on this issue is contained in Chapter 3 under "Timber" and in Appendix B.

Net Revenues

The ID Team developed a methodology to calculate the "projected net revenue" based on the scheduled harvest of timber from lands suitable for timber production. These numbers are an indication of relative cash flow from the timber sale program and give an indication of the degree that any alternative is "below-cost".

Graph 2-25 contains the projected net revenue for the alternatives. As Alternatives 3 and 6 have no suitable lands nor allowable sale quantity, they show no projected net revenue. The figures in Graph 2-25 represent the undiscounted net revenues in thousands of dollars for an average year during the first decade.

Graph 2-25.
Projected Net Revenue



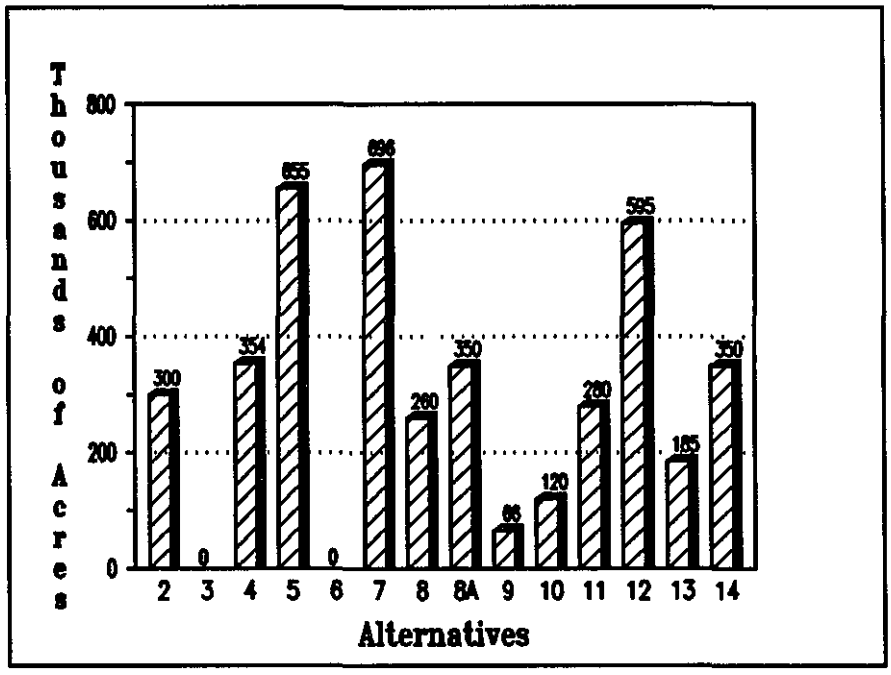
On July 31, 1985, Deputy Assistant Secretary of Agriculture Douglas W. MacCleery rendered the *USDA Decision on Review of Administrative Decision by Chief of the Forest Service Related to the Administrative Appeals of the Forest Plans and EISs for the San Juan National Forest and the Grand Mesa, Uncompahgre, and Gunnison National Forests.* This was a benchmark decision that established the Department of Agriculture requirements for economic analysis needed to support a below-cost timber sales program that is designed to provide multiple-use benefits.

Appendix B on pages B-95 to B-97 responds to these requirements.

Suitable Lands

Graph 2-26 contains a breakdown of the lands suitable for timber production in each of the alternatives.

Graph 2-26.
Lands Suitable for Timber Production



Allowable Sale Quantity

Table 2-4 contains the total allowable sale quantity for each alternative. The allowable sale quantity is expressed as the total volume that could be offered during the first decade of the Revised Forest Plan.

Table 2-4.
Allowable Sale Quantity for All Products

Alternative	Millions of Board Feet	Millions of Cubic Feet
2	380	54
3	0	0
4	400	57
5	680	97
6	0	0
7	520	74
8	270	39
8A	330	47
9	80	11
10	150	21
11	210	30
12	450	64
13	150	21
14	350	50

Allowable Sale Quantity

(Continued)

Because the public has expressed concern over the breakdown of allowable sale quantity by types of timber products, Table 2-3 displays a breakdown of allowable sale quantity in terms of hardwood and softwood sawtimber and pulpwood. It is assumed that any fuelwood offered for sale on lands suitable for timber production would be included in the hardwood pulpwood.

Table 2-5.
Percentage of Allowable Sale Quantity by Product.

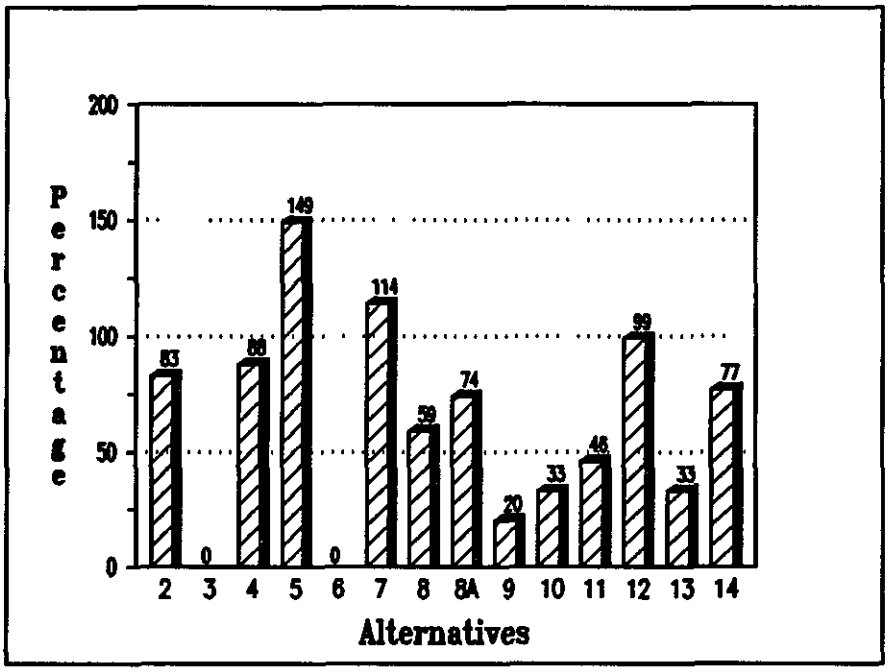
Alternative	Hardwood Sawtimber	Softwood Sawtimber	Hardwood Poletimber[1]	Softwood Poletimber
2	27.6	0.5	71.1	0.8
3	0	0	0	0
4	27.5	0	72.5	0
5	27.9	0	72.1	0
6	0	0	0	0
7	25.0	3.1	66.9	5.0
8	27.8	0.4	71.1	0.7
8A	27.6	0.3	71.8	0.3
9	15.0	11.3	43.8	30.0
10	29.3	0	70.7	0
11	20.5	8.1	59.0	12.4
12	25.3	2.7	68.2	3.8
13	27.4	1.3	70.0	1.3
14	28.0	0	72.0	0

[1]Includes fuelwood.

Supply/Demand For Timber Products

Graph 2-27 contains a comparison of the percentage of demand for timber products that would be met if the entire ASQ associated for each alternative was offered. Additional disclosure on this subject is contained in Chapter 3 and Appendix B of this document.

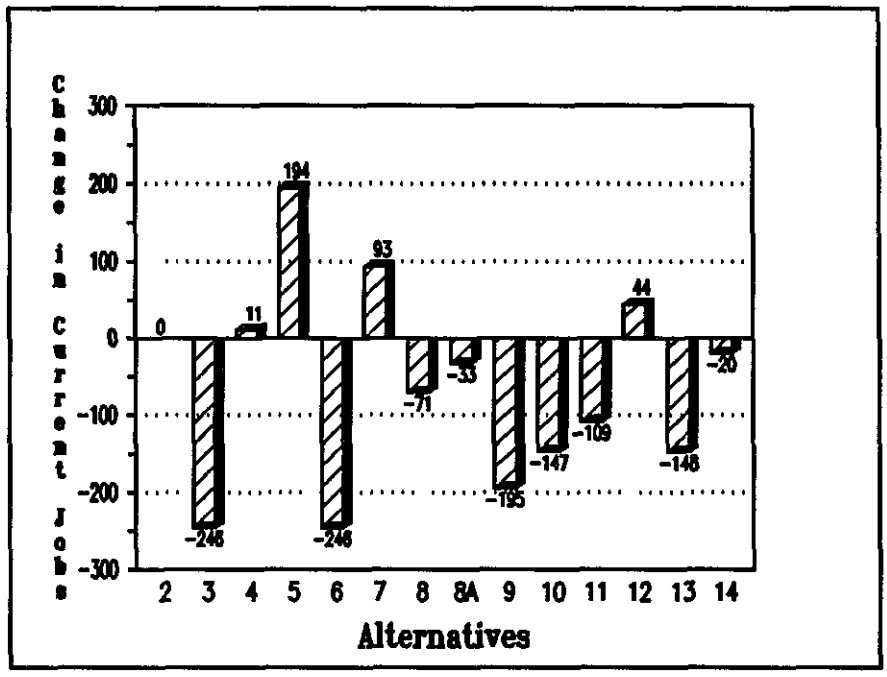
Graph 2-27.
Supply of Timber Products as a Percentage of Demand



Employment in the Timber Industry

Graph 2-28 contains the estimated changes in employment in the timber industry which might occur as a result of changes in the volume of timber offered in each alternative. As discussed in Chapter 3 of this FEIS, this degree of change is only a relative index.

Graph 2-28.
Change in Employment for the Timber Industry



ISSUE 3: FOREST ACCESS

This issue deals with (1) concerns over motorized access, (2) the management of system roads, (3) licensed off-highway vehicle (primarily 4-wheel drive and other high clearance vehicle) use, (4) access for individuals with disabilities and (5) hiking trails. The ID Team identified two factors which vary appreciably between alternatives and form a basis for comparing how the alternatives respond to this issue. Additional disclosure is contained in Chapter 3 of this document under the headings of "Dispersed Recreation" and "Roads and Facilities".

Road Construction

Table 2-6 displays the estimated range of average annual miles of road construction during the first decade of the Revised Forest Plan. This information is discussed in more detail in Chapter 3 under "Roads and Facilities".

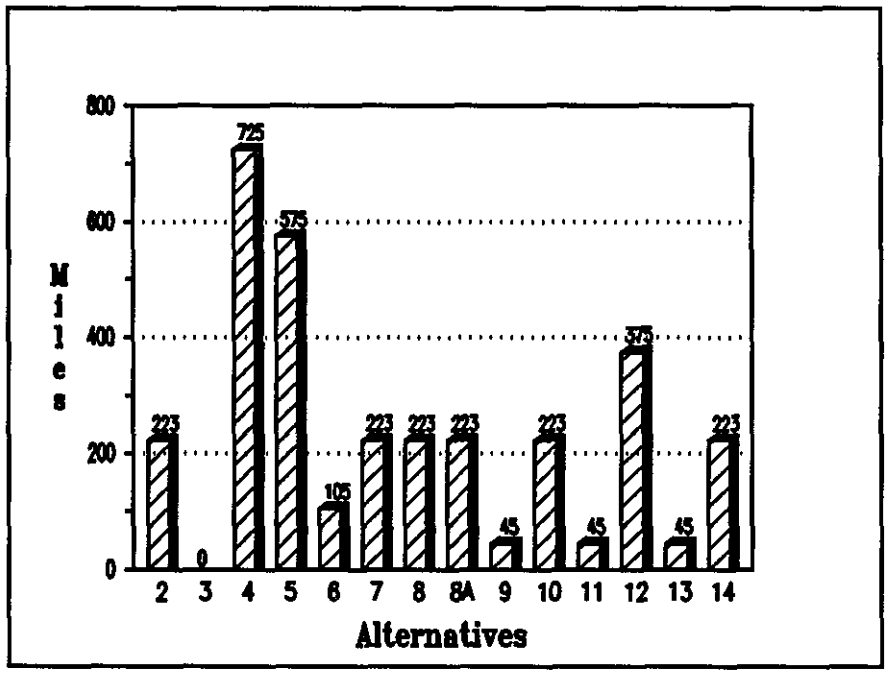
Table 2-6.
Average Annual Road Construction

Alternative	New Construction Miles/Year First Decade
2	5 to 8
3	0
4	6 to 9
5	9 to 13
6	0
7	9 to 13
8	4 to 7
8A	5 to 8
9	1 to 2
10	2 to 3
11	0
12	7 to 11
13	0
14	5 to 8

Licensed OHVs

Graph 2-29 displays the estimated miles of roads that would be open year round and offer a experience for licensed off-highway vehicle (OHV) use. This mileage includes opened roads identified as Licensed OHV Routes and gated system roads that would be opened for Licensed OHV Use. Additional information and disclosure is contained in Chapter 3 of this document under "Dispersed Recreation".

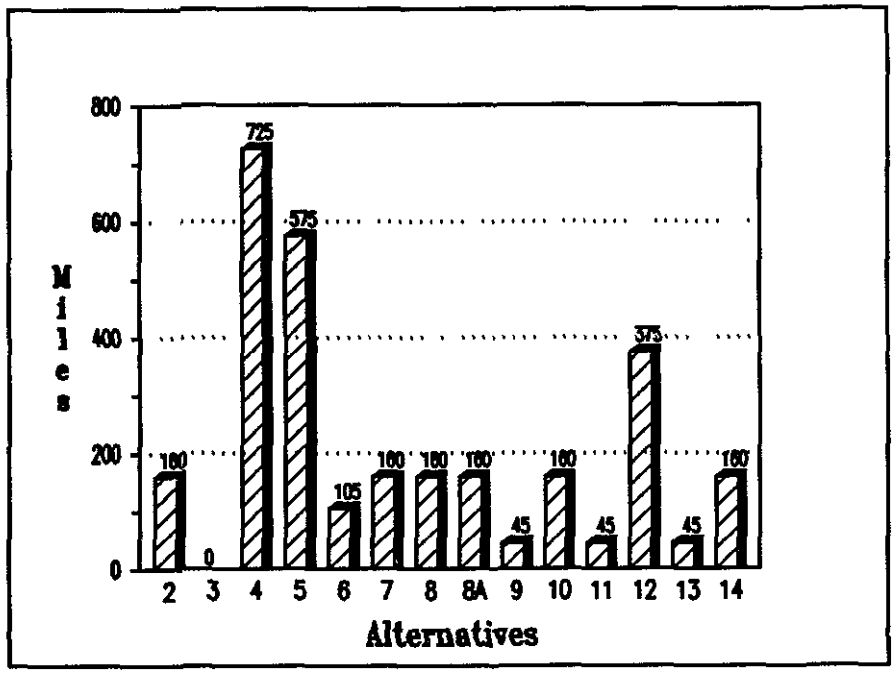
Graph 2-29.
Miles of Licensed OHV Routes



ISSUE 4: ALL-TERRAIN VEHICLE (ATV) USE

This issue deals with concerns over the use and management of unlicensed OHV vehicles (all-terrain vehicles and trailbikes) The ID Team identified two factors which vary appreciably between alternatives and form a basis for comparing how the alternatives respond to this issue. The two factors are (1) total miles of ATV trails and (2) total number of ATV trail systems. Graph 2-30 displays the estimated miles of unlicensed OHV (ATV) trail systems. Additional information is provided in Chapter 3 under "Dispersed Recreation".

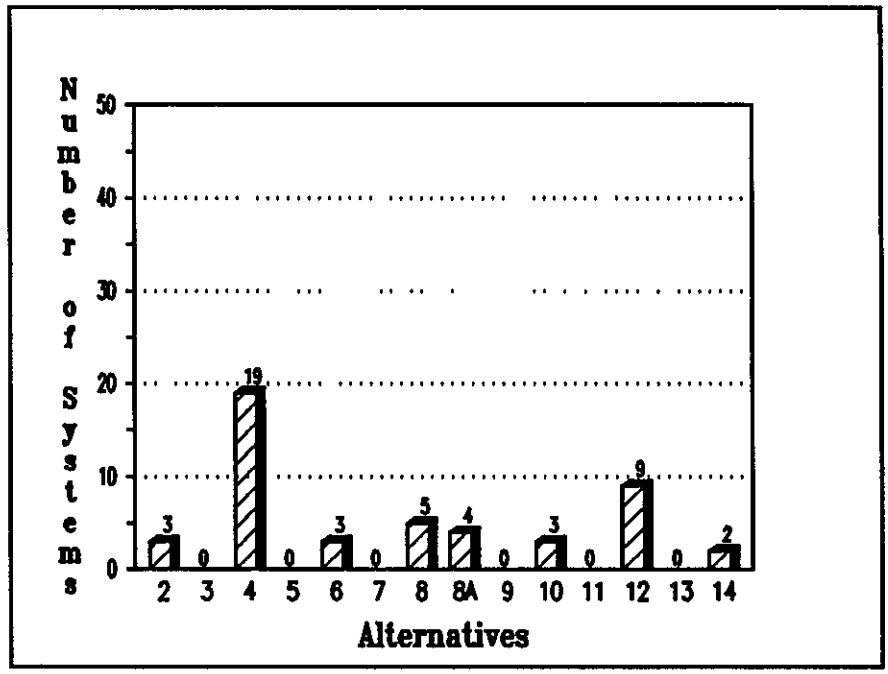
Graph 2-30.
Miles of Unlicensed OHV Trails



Unlicensed OHV Trail Systems

Graph 2-31 displays the number of unlicensed OHV trails systems. Additional information is provided in Chapter 3 under "Dispersed Recreation".

Graph 2-31.
Number of Unlicensed OHV Trail Systems



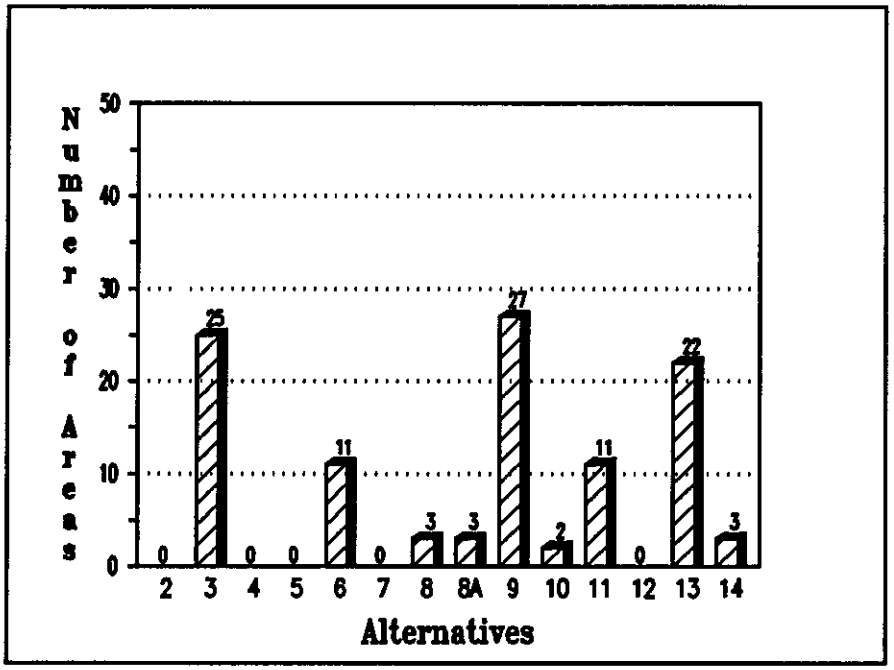
ISSUE 5: ROADLESS AREA MANAGEMENT

This issue deals with concerns over the values inherent in roadless areas and how roadless areas are to be managed. The ID Team identified three factors which varied appreciably between alternatives and form a basis for comparing how the alternatives respond to this issue. These factors are: (1) number of roadless areas recommended for wilderness study, (2) thousands of acres of roadless areas recommended for wilderness study, and (3) percentage of roadless areas protected from development.

Roadless Areas Recommended for Wilderness Study

Graph 2-32 displays the number of roadless areas recommended for wilderness in each of the alternatives. Such a recommendation forms one possible response to this issue.

Graph 2-32.
Number of Roadless Areas Recommended for Wilderness Study

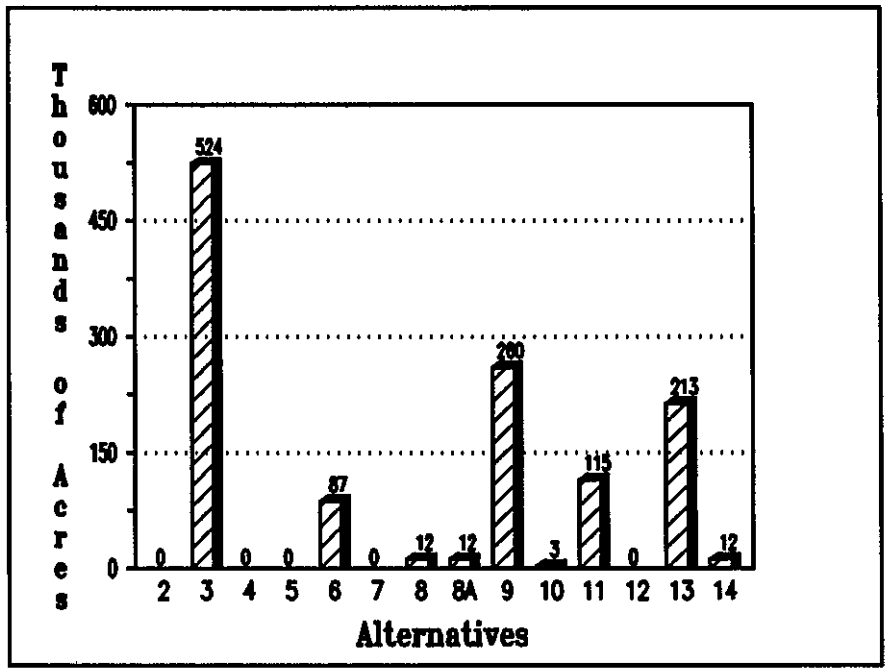


Roadless Areas Recommended for Wilderness Study

(Continued)

Graph 2-33 displays the acreage in the roadless areas recommended for wilderness study.

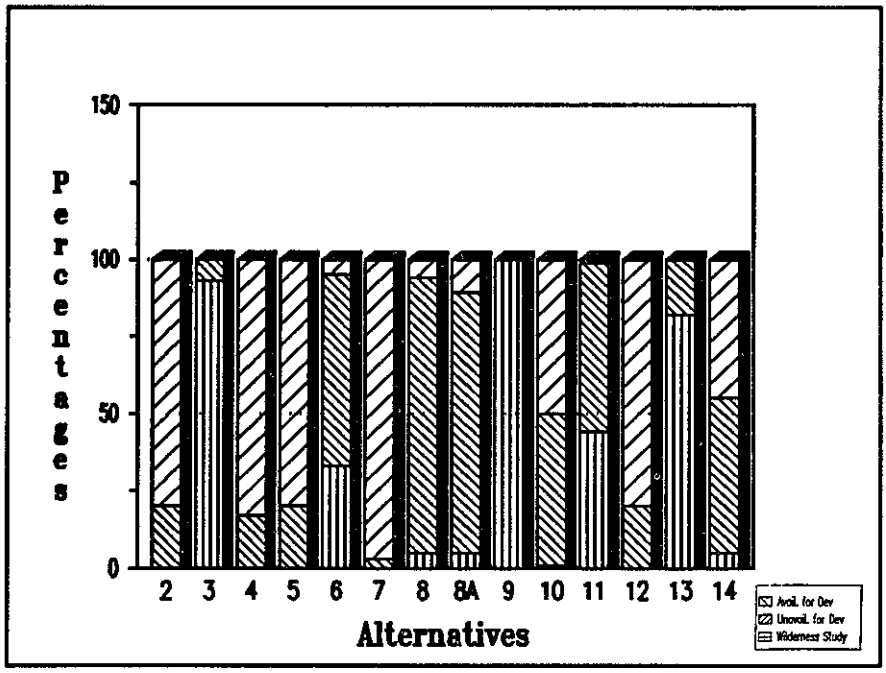
Graph 2-33.
Thousands of Acres of Roadless Areas Recommended for Wilderness Study



Management of Roadless Areas

There are other possible responses to this issue involving placing roadless areas in management areas that permit, limit or prohibit management practices that might eliminate the remote qualities of roadless areas. Table 3-17 in Chapter 3 of this FEIS details a breakdown by alternative of the allocation of each roadless area to (1) a management area where it would be recommended for wilderness study, (2) management areas that would make it unavailable for development or (3) management areas that would make it available for development. Graph 2-34 shows a comparison of this information for all the roadless areas.

Graph 2-34.
Allocation of Roadless Areas



ISSUE 6: SPECIAL RECREATION MANAGEMENT

This issue deals with concerns over (1) the management of existing wilderesses, (2) the management of rivers qualifying for wild & scenic river designation, (3) the designation of scenic byways, (4) areas of important scenic and recreational value, (5) management of the Appalachian National Scenic Trail and (6) fisheries management. The ID team identified two factors which vary appreciably among the alternative and form a basis for comparing how the alternatives respond to this issue. These factors are: (1) areas where scenic and/or recreational values are emphasized and (2) approaches to fisheries management.

Table 2-7 displays thousands of acres where scenic and/or recreation values are emphasized.

Table 2-7
Thousands of Acres with Scenic/Recreation Emphasis[1]

Alternative	M Acres
2	40
3	237
4	34
5	40
6	160
7	39
8	146
8A	176
9	124
10	71
11	165
12	39
13	261
14	144

[1]Includes management areas 5, 6, 7, 10, 12, 13, 21, and 22.

Table 2-8 displays how two approaches to the management of fisheries are incorporated into alternatives.

Table 2-8.
Management of Fisheries by Alternatives

Alternatives	Type of Management
2, 4, 5, 6, 7, 8 8A[2], 11, 12, 13 & 14	Current fish management practices.
3 & 9	No put-and-take trout program.

[2]Forest Service preferred alternative.

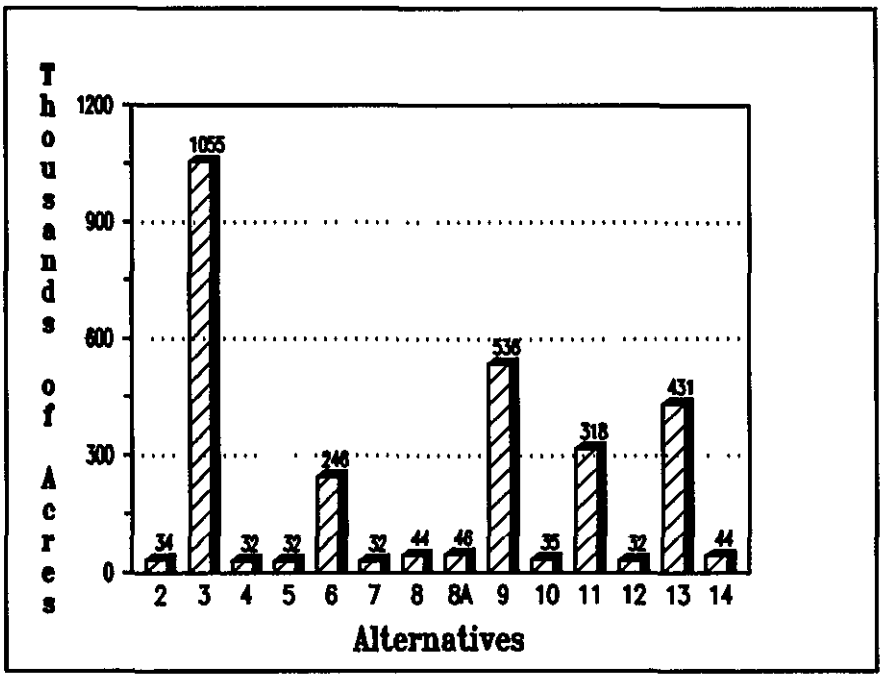
ISSUE 7: AESTHETICS

This issue deals with concerns over (1) updating the visual quality objective inventory, (2) the effects of management activities on aesthetics, (3) opposition to the maximum modification VQO and (4) visual quality objectives as a management goal. The ID Team identified the estimated number of acreages in different visual quality objectives as the factor which differed significantly between the alternatives. There is more information on visual quality objectives in Chapter 3 and Appendix G of this document.

Visual Quality Objectives

Graph 2-35 displays the estimated acreage with the visual quality objective of preservation by alternative. This acreage equates to the existing wilderness-es and roadless areas recommended for wilderness study (Management Area 8).

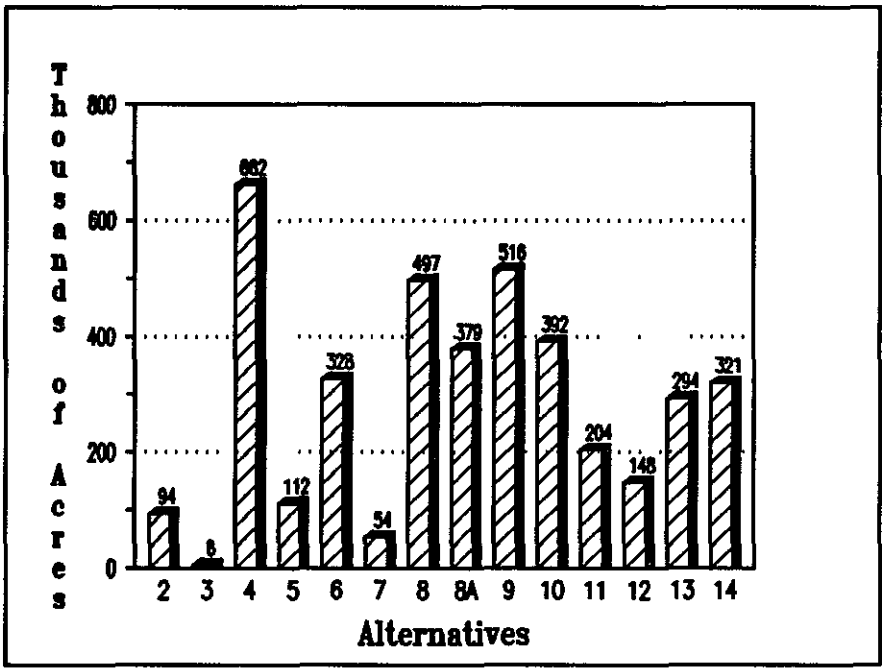
Graph 2-35.
Thousands of Acres Managed as Preservation VQO



Visual Quality Objectives

Graph 2-36 displays the estimated acreage with the visual quality objective of retention by alternative.

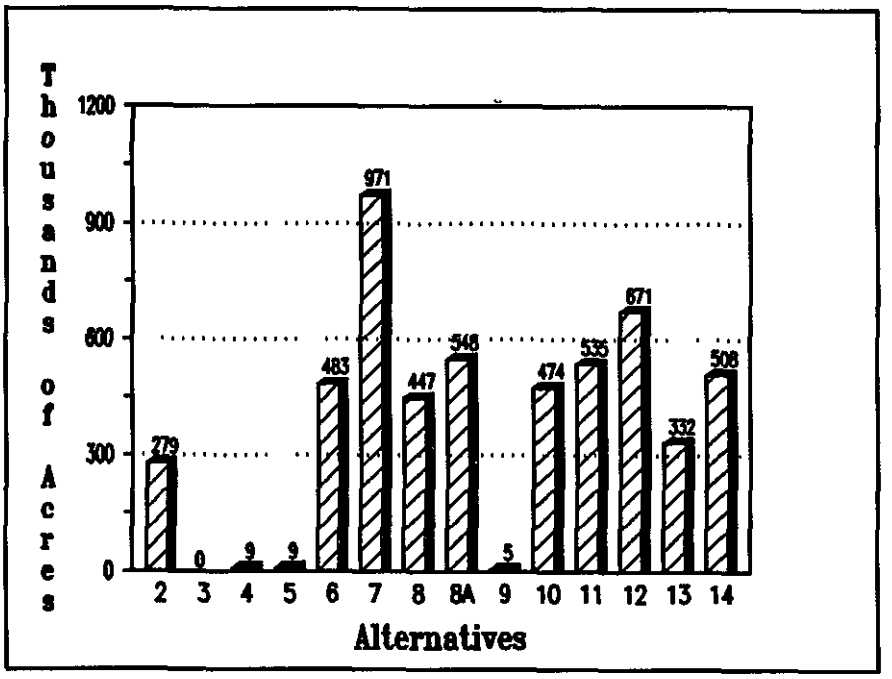
Graph 2-36.
Thousands of Acres Managed as Retention VQO



Visual Quality Objectives

Graph 2-37 displays the estimated acreage with the visual quality objective of partial retention by alternative.

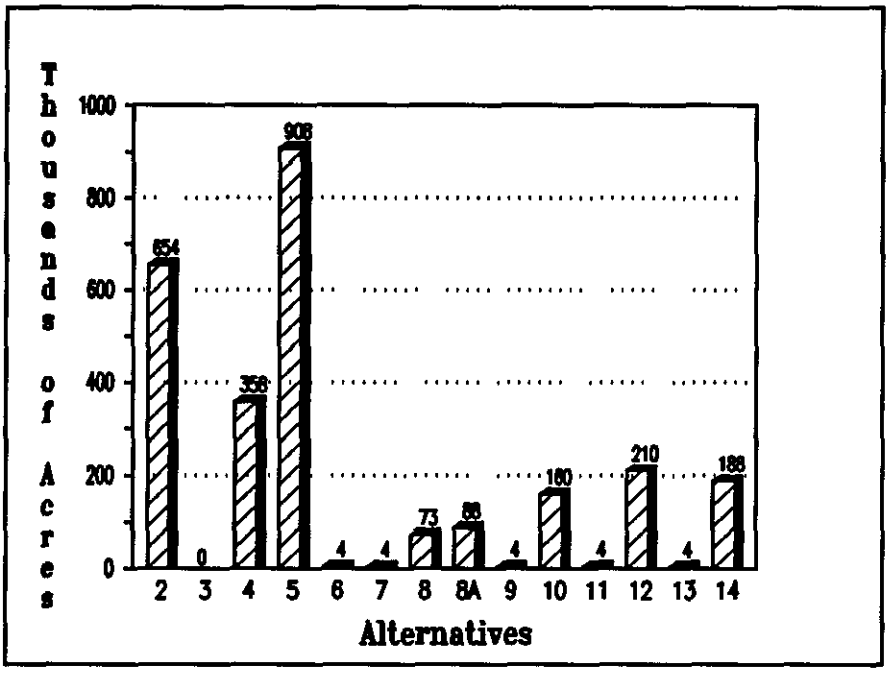
Graph 2-37.
Thousands of Acres Managed as Partial Retention VQO



Visual Quality Objectives

Graph 2-38 displays the estimated acreage with the visual quality objective of modification by alternative.

Graph 2-38.
Thousands of Acres Managed as Modification VQO



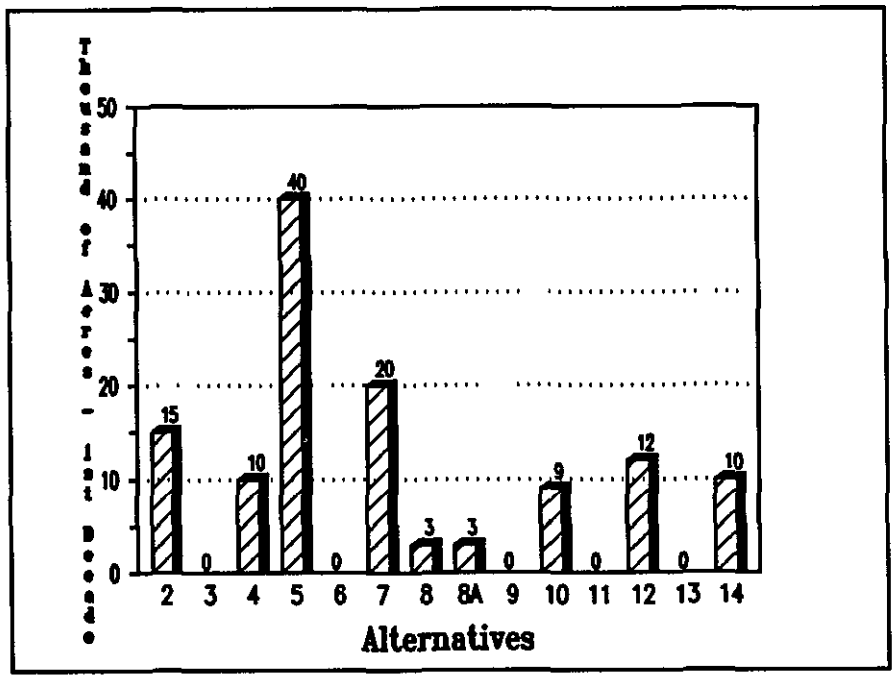
ISSUE 8: VEGETATION MANIPULATION

This issue deals with concerns over the (1) NFMA requirement for clearcutting, (2) the use of clearcutting and other even-aged timber harvest cutting methods and (3) featured species for wildlife management. The ID Team identified six factors which varied appreciably between alternatives and form a basis for comparing how the alternatives respond to this issue. The acreage in Management Areas 14, 15, 16 and 22 also offer a relative index of the amount of lands where wildlife management is emphasized. There is additional disclosure in Chapter 3 of this document under the headings of "Timber", "Vegetation" and "Wildlife".

Clearcutting

Graph 2-39 displays the estimated thousands of acres of clearcutting for each alternative for the first decade.

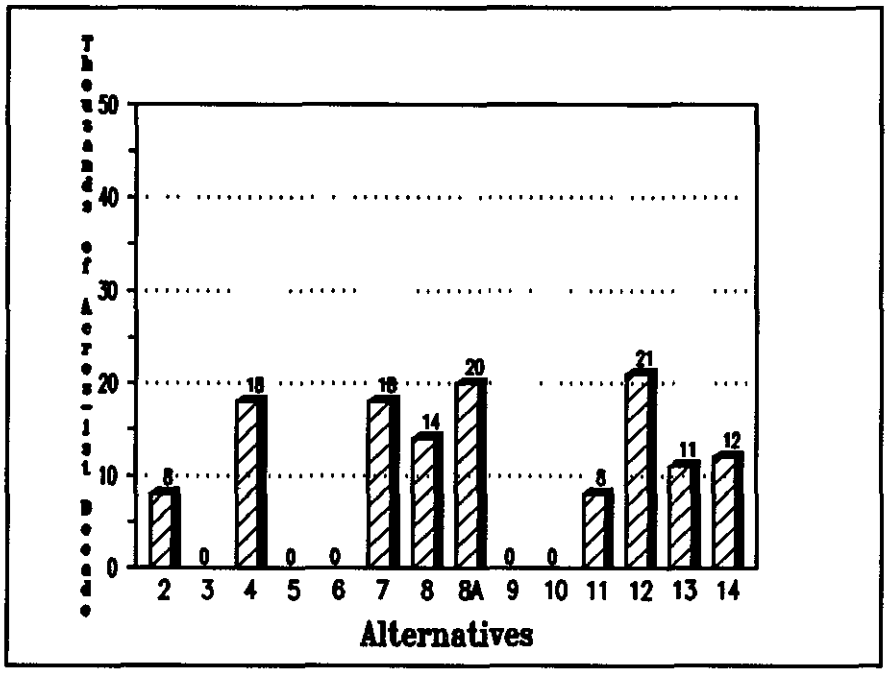
Graph 2-39.
Thousands of Acres of Clearcutting



Other Even-aged Harvest Methods

Graph 2-40 displays the estimated thousands of acres of other even-aged timber harvest cutting for each alternative for the first decade.

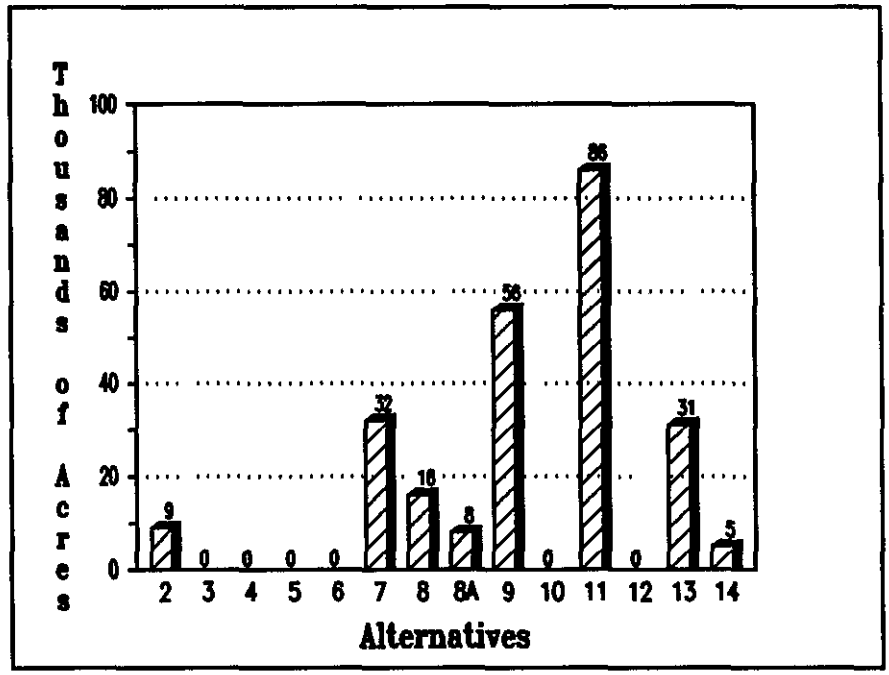
Graph 2-40.
Thousands of Acres of Other Even-aged Timber Harvest Methods



Uneven-aged Management

Graph 2-41 displays the acreages dedicated to uneven-aged management in each alternative.

Graph 2-41.
Thousands of Acres[1] Dedicated to Uneven-aged Management

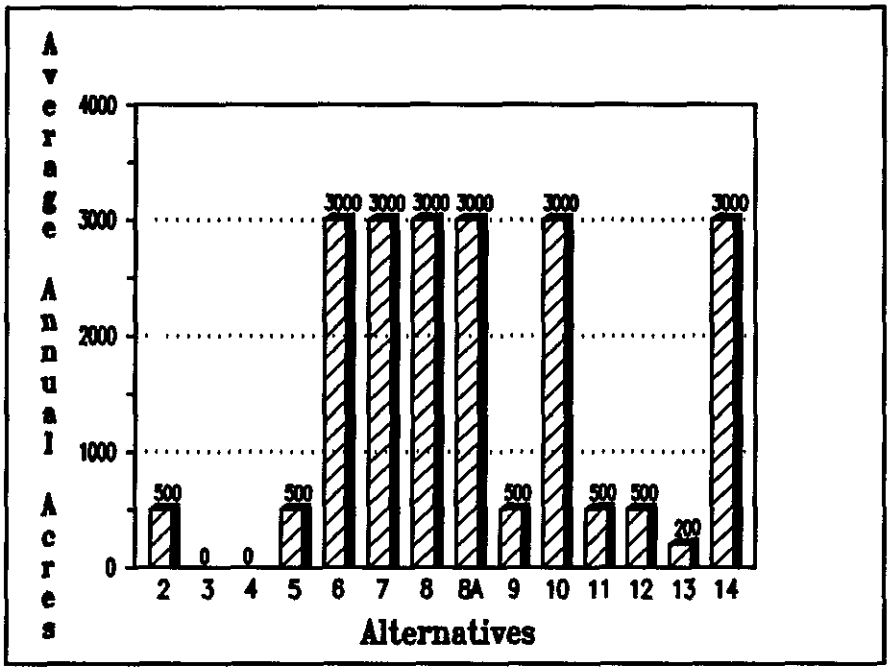


[1]These are acres where uneven-aged treatments will be employed, not the acres of "openings" created.

Prescribed Burning

Graph 2-42 displays the average annual acreages of prescribed burning in each alternative.

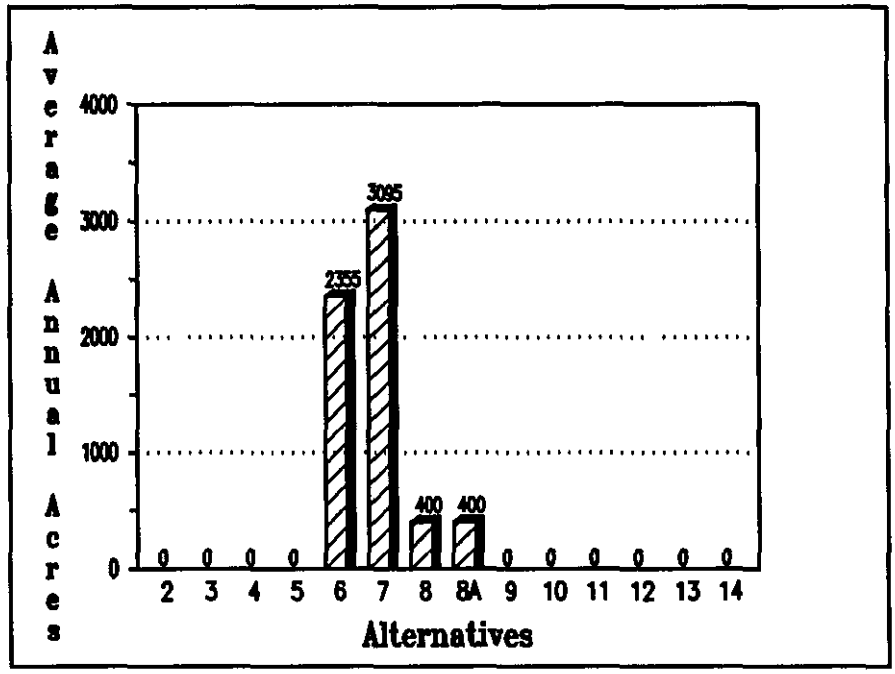
Graph 2-42.
Prescribed Burning



Wildlife Clearings

Graph 2-43 displays the average annual acreages of wildlife clearings maintained in each alternative.

Graph 2-43.
Wildlife Clearings Maintained.

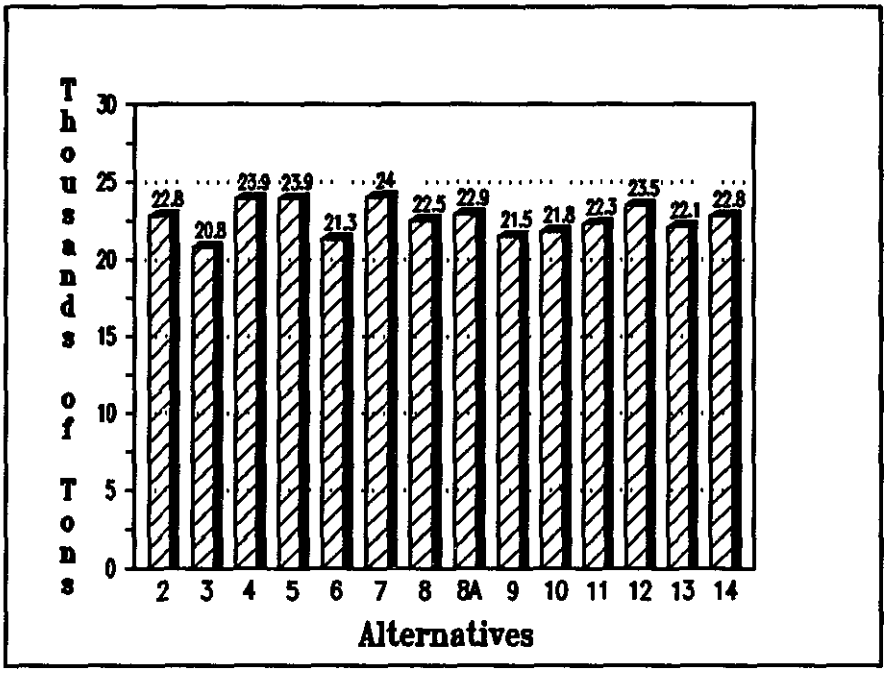


ISSUE 9: RESOURCE SUSTAINABILITY

This issue deals with concerns over (1) ecosystem management, (2) extirpated species, (3) timber management, (4) herbicides, (5) water quality, (6) soil productivity and (7) hazards of wildfire. Alternative 3 responds to most of these concerns.

The ID Team identified two measurable factors, however, which varied appreciably between alternatives and forms a basis for comparing how the alternatives respond to this issue: sediment and soil erosion. Graph 2-44 displays the average annual sediment associated with each alternative

Graph 2-44.
Average Annual Sediment (Natural and Human Caused)*

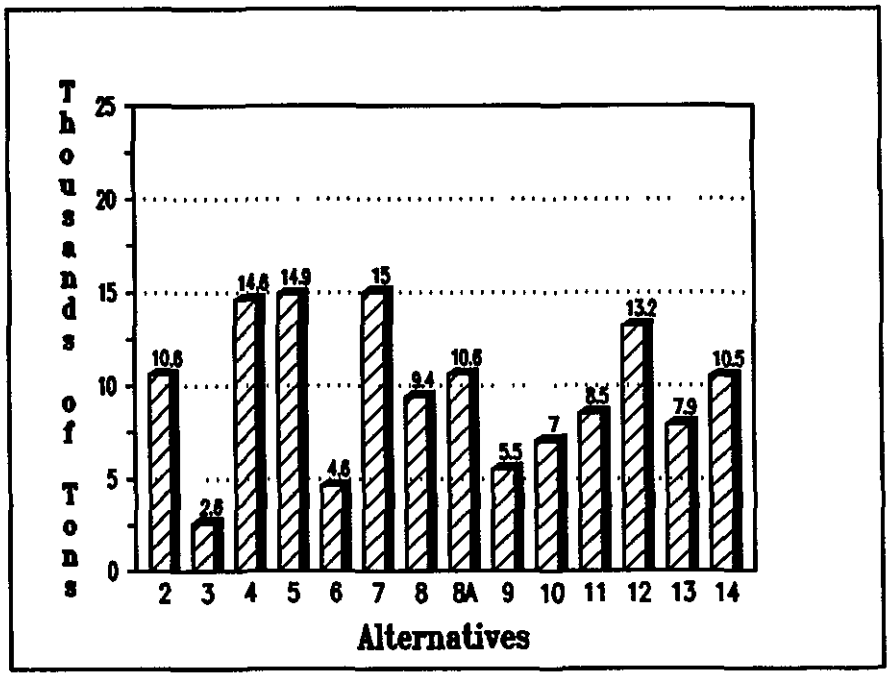


*Natural sediment averages approximately 20.1 thousand tons/year.

Erosion

Graph 2-45 displays the average annual accelerated soil erosion from human-caused activities.

Graph 2-45.
Average Annual Accelerated Erosion from Human Activities



ISSUE 10: MINERALS

This issue deals with concerns over the management of minerals. The ID Team identified acres available for minerals as the one factor which varied appreciably between alternatives and forms a basis for comparing how the alternatives respond to this issue. This is displayed in Tables 2-9 thru 2-11.

Table 2-9.
Thousands of Acres Available for Leasable Energy (Oil and Gas) Minerals[1]

Alternatives	Leasing with Standard Stipulations	Leasing with Special Stipulations	Leasing with No Surface Occupancy	Unavailable due to Congressional Action[2]	Unavailable due to Administrative Action
2	338	644	47	32	0
3	0	0	0	32	1,029
4	933	70	26	32	0
5	916	84	29	32	0
6	33	943	53	32	0
7	194	794	41	32	0
8	223	768	38	32	0
8A	145	842	42	32	0
9	51	918	60	32	0
10	396	591	42	32	0
11	12	964	53	32	0
12	397	600	41	32	0
13	6	982	53	32	0
14	298	691	40	32	0

[1]The above acreage figures do not distinguish between Federal and private mineral rights Approximately 19 percent of the Forest contains private mineral holdings
[2]Additional lands would be added to this classification if roadless areas recommended for wilderness study in Alternatives 3, 6, 8, 8A, 9, 10, 11, 13 and 14 were designated as wilderness through legislation

Table 2-10.
Thousands of Acres Available for Non-Energy Leasable Minerals by Alternative[1]

Alternatives	Leasing Generally Available	Leasing on Case by Case Basis	Unavailable due to Congressional Action[2]	Unavailable due to Administrative Action
2	698	300	32	21
3	0	0	32	1,029
4	942	68	32	19
5	924	84	32	21
6	342	648	32	20
7	764	245	32	20
8	529	482	32	18
8A	479	532	32	18
9	189	825	32	15
10	710	298	32	21
11	312	700	32	17
12	802	206	32	21
13	190	824	32	15
14	535	475	32	19

[1]The above acreage figures do not distinguish between Federal and private mineral rights Approximately 19 percent of the Forest contains private mineral holdings
[2]Additional lands would be added to this classification if roadless areas recommended for wilderness study in Alternatives 3, 6, 8, 8A, 9, 10, 11, 13 and 14 were designated as wilderness through legislation

Table 2-11.
Thousands of Acres Available for Salable Minerals by Alternative[1]

Alternatives	Mineral Material Sales Allowed	Mineral Material Sales on Case by Case Basis	Unavailable due to Congressional Action[2]	Unavailable due to Administrative Action
2	330	670	32	29
3	0	0	32	1,029
4	924	76	32	29
5	907	93	32	29
6	26	894	32	109
7	185	824	32	20
8	214	786	32	29
8A	141	858	32	30
9	47	707	32	275
10	387	971	32	42
11	4	891	32	134
12	379	621	32	29
13	0	802	32	227
14	283	716	32	30

[1]The above acreage figures do not distinguish between Federal and private mineral rights Approximately 19 percent of the Forest contains private mineral holdings
[2]Additional lands would be added to this classification if roadless areas recommended for wilderness study in Alternatives 3, 6, 8, 8A, 9, 10, 11, 13 and 14 were designated as wilderness through legislation.

The FEIS also explores the question of where leasing for oil and gas will be allowed. The Alleghany Front Lease Area (AFLA), described in more detail in Chapter 3 of this document under the heading of "Minerals", is the area selected for leasing activities. Table 2-12 displays the acreage where leasing of natural gas could occur.

Table 2-12.
Thousands of Acres Where the Forest Service Consents to Lease Oil and Natural Gas in the Alleghany Front Lease Area[1]

Alternatives	Lease with *Standard Sales* Stipulations	Lease with Controlled *Use/Timing* Stipulations	Lease with No *Surface* Stipulations	Unavailable due to *Administrative* Action
2	The decision to consent to leasing is deferred and evaluated with each proposal			
3	0	0	0	75
4	65	9	1	0
5	65	9	1	0
6	3	71	1	0
7	10	64	1	0
8	5	69	1	0
8A	5	69	1	0
9	0	74	1	0
10	40	34	1	0
11	0	74	1	0
12	27	47	1	0
13	0	74	1	0
14	5	69	1	0

[1]The above acreage figures do not distinguish between federal and private mineral rights Approximately 19 percent of the Forest contains private mineral holdings on which development rights may be reserved or outstanding

ISSUE 11: GYPSY MOTH

This issue deals with concerns over (1) the policy on gypsy moth in the Revised Forest Plan (2) control of gypsy moth populations and (3) use of silvicultural practices in regard to gypsy moth. The ID Team identified one factor which differs significantly between alternatives and forms a basis for comparing how the alternatives respond to this issue. Table 2-13 displays the acres available for control of gypsy moth in each alternative.

Table 2-13.
By Alternative, Thousands of Acres That May Be Considered for Insecticide Treatment[1]

Alternative	Generally Available	Available Under Limited Circumstances	Not Available
2	898	163	0
3	0	0	1,061
4	935	126	0
5	926	135	0
6	435	545	81
7	973	88	0
8	596	465	0
8A[2]	668	393	0
9	175	779	107
10	647	414	0
11	521	540	0
12	927	134	0
13	188	766	107
14	685	376	0

[1]These figures represent the maximum number of acres which could be considered for insecticide treatment. The actual number of acres to be treated must be determined by a site-specific environmental analysis
[2]Forest Service preferred alternative.

ISSUE 12: ADEQUACY OF THE REVISION

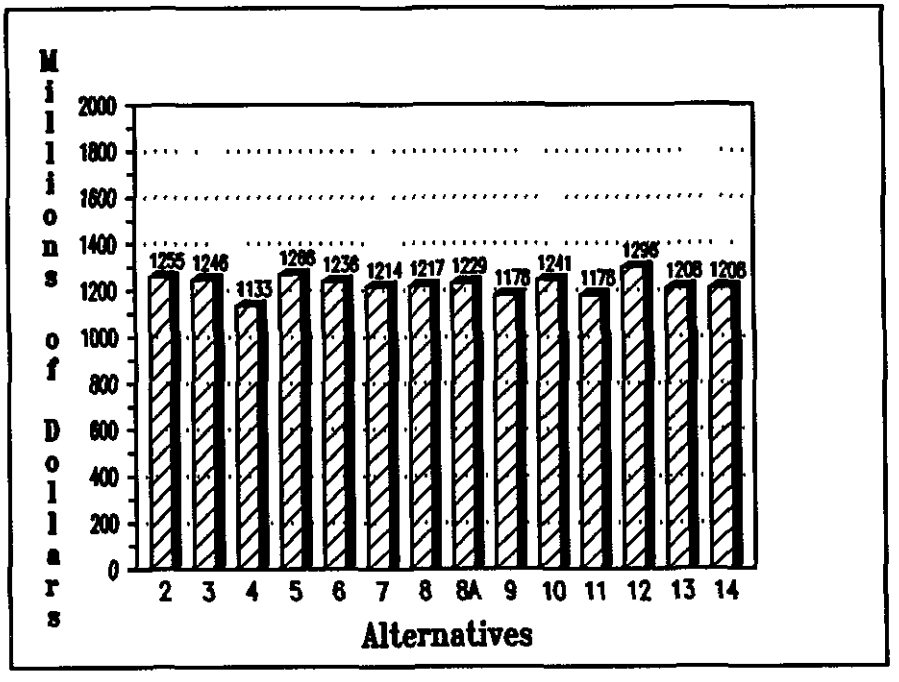
This issue concerns legal questions over the compliance with NEPA, NFMA and other laws. Appendices A and B contain information which form the basis for responding to most of the concerns grouped under this issue.

The ID Team identified four social and economic factors which differ significantly between alternatives. This information is displayed under this issue for the sake of convenience.

Present Net Value

Graph 2-46 displays the present net value for each alternative. Present net value is an indicator of economic efficiency and is described in Appendix B.

Graph 2-46.
Present Net Value



Present Net Value

Table 2-14 is required by the Forest Service to demonstrate the relationship of the discounted benefits compared to the discounted costs for each of the alternatives. This same information is also provided for the maximum present net value (assigned values) benchmark which represents the most economically efficient management of the Forest regardless of any goals or objectives. All numbers are in millions of dollars. An explanation is included in Appendix B pages B-90 to B-95.

Table 2-14
Present Net Benefits and Present Net Costs for the Alternatives.

		Present Net Values		Costs				Benefits			
Alternative	PNV	Costs	Benefits	Timber	Engineering	Wildlife	Other[1]	Timber	Recreation	Wildlife	Other[2]
MAXPNV	1313 8	345 3	1659 1	46 2	73 6	18 8	206 7	41 4	873 9	743 6	2
12	1296 3	357 7	1654 0	45 1	74 1	19 7	218 8	37 0	873 9	742 9	2
5	1265.6	372 4	1638 0	59 0	77 2	19 7	216 5	54 4	858 3	725 1	2
2	1254 5	335.6	1590.1	36 3	72 2	19 7	207 4	29 4	873 9	686 6	2
3	1245 6	225 0	1470 6	0	15 8	1.9	207.3	0	826 7	643 7	2
10	1240 9	315 4	1556 3	15 1	69 5	32 7	198 1	12 8	873 9	669 4	2
6	1235 9	351 1	1587 0	0	63.6	59 0	228 5	0	873.9	712.9	2
8A	1228.9	383 8	1612 7	32 3	72 6	37 9	241 0	25 3	873.9	713.3	2
8	1217.4	378 4	1595 8	27.3	71.3	37.9	241.9	21.1	873 9	700.6	2
7	1213 7	446.3	1660.0	55 2	75 1	68 5	247 5	43 0	873 9	742 9	2
14	1208 4	407 2	1615 6	36 3	72 8	27 8	270 3	29 8	873 9	711 7	2
13	1207 9	326 6	1534 5	20 2	63 9	19 2	223 3	13 8	849 9	670.6	2
11	1178 3	404 3	1582 6	27 9	63 9	21 1	291 4	16 4	873 9	692.1	2
9	1177 6	315 8	1493.4	13 5	68 1	20 3	213 9	5 5	834 3	653 4	2
4	1132 6	389 6	1522 2	38 9	86 8	2 1	261 8	33 7	870 0	618 3	2

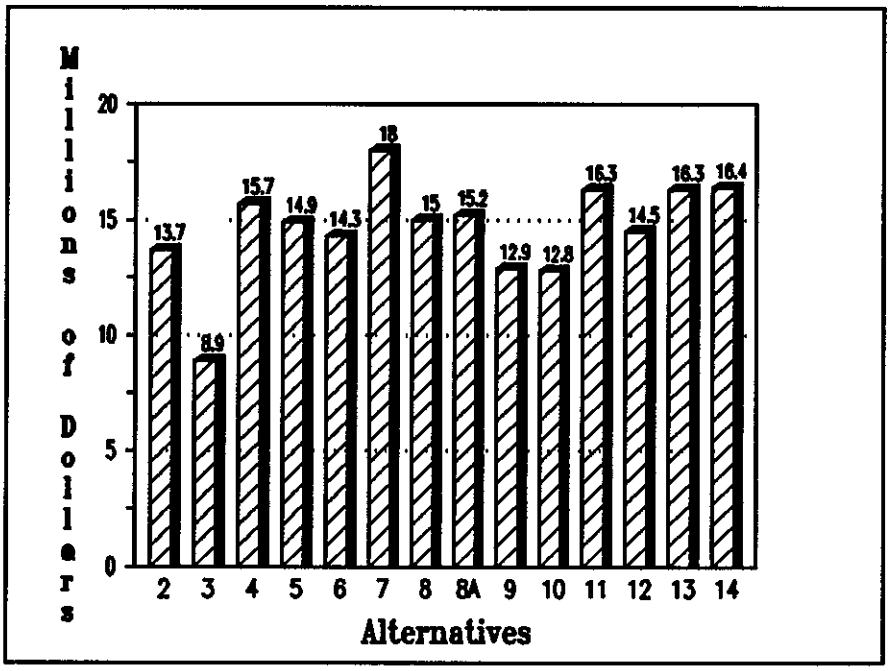
[1]Other costs include recreation, lands, fire, minerals, soil & water, range, recreation, planning, law enforcement, and general administration

[2]Other benefits include mineral leases (oil and gas)

Budget

Graph 2-47 displays the budget required to implement each of the alternatives in millions of dollars.

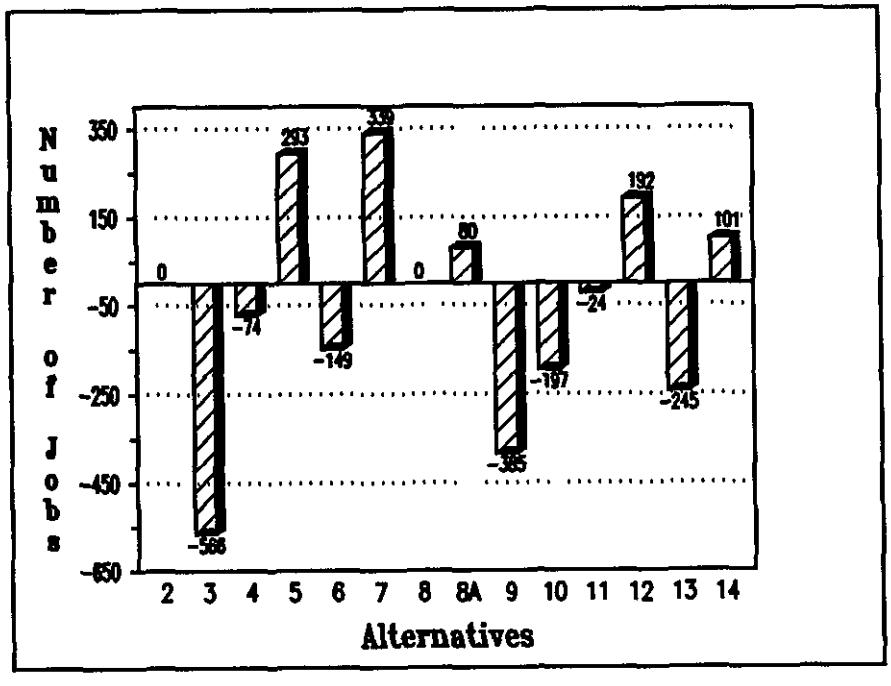
Graph 2-47.
Budget Required to Implement Alternatives
Average Annual for Decade 1



Employment

Graph 2-48 displays the change in employment which is expected to occur as a result of implementing each alternative. As discussed in Chapter 3, this information is only a relative indicator of change.

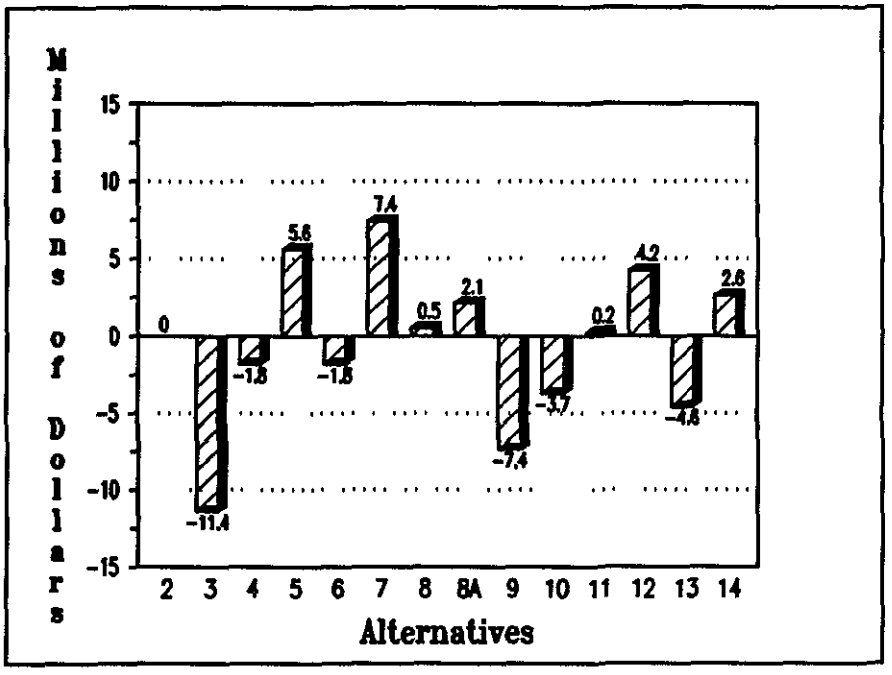
Graph 2-48.
Change In Average Annual Employment for Decade 1



Income

Graph 2-49 displays the change in average annual income which is expected to occur as a result of implementing each alternative. As discussed in Chapter 3, this information is only a relative indicator of change.

Graph 2-49.
Change in Average Annual Income for Decade 1



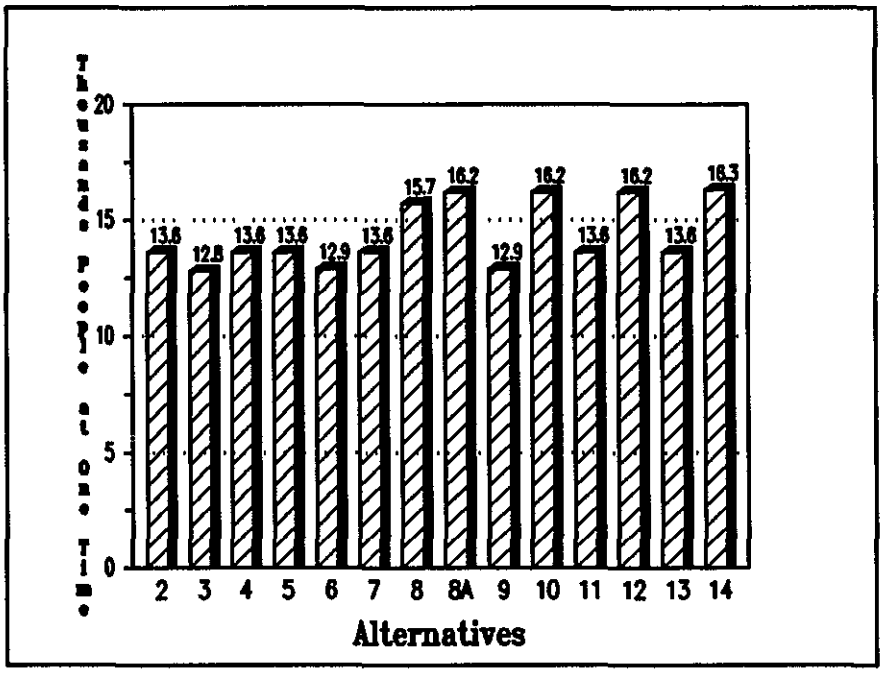
ISSUE 13: THE MIX OF GOODS AND SERVICES

This issue deals with concerns over the relative emphasizing of different natural resources (in the form of goods and services). The ID Team identified the following factors which differ significantly between alternatives and form a basis for comparing how the alternatives respond to this issue.

Developed Recreation

Graph 2-50 displays the capacity of developed recreation sites in each alternative.

Graph 2-50.
Developed Recreation Site Capacity

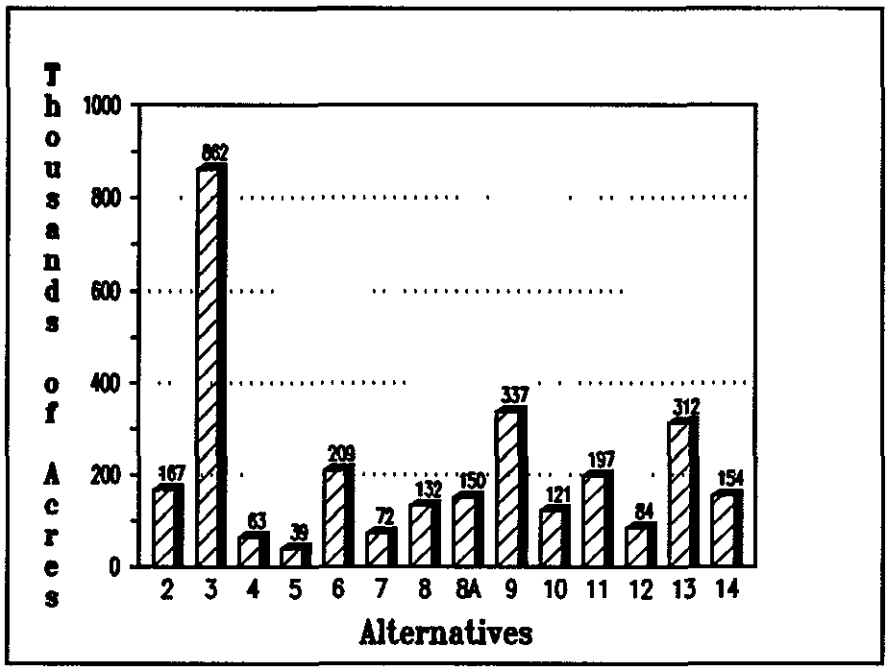


Dispersed Recreation

The response to dispersed recreation emphasis can best be addressed by the number of acres where certain recreation opportunity spectra (ROS) experiences are provided. Appendix G of this document contains a discussion of the use of adopted ROS classes.

Graph 2-51 displays the amount of semi-primitive non-motorized ROS setting in each alternative.

Graph 2-51.
Thousands of Acres Managed as Semi-Primitive Non-Motorized ROS

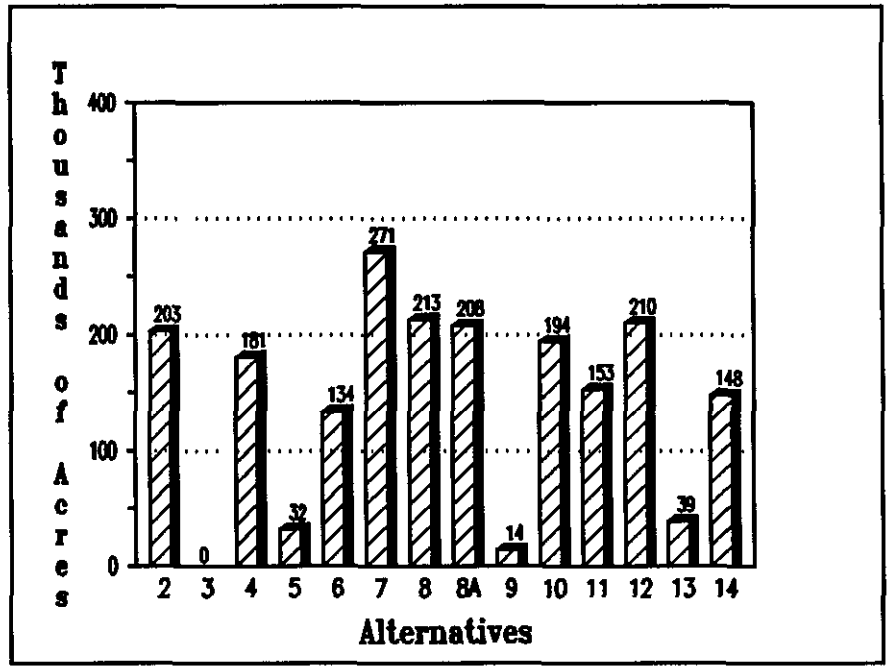


Dispersed Recreation

(Continued)

Graph 2-52 displays the amount of semi-primitive motorized ROS setting in each alternative.

Graph 2-52.
Thousands of Acres Managed as Semi-Primitive Motorized ROS

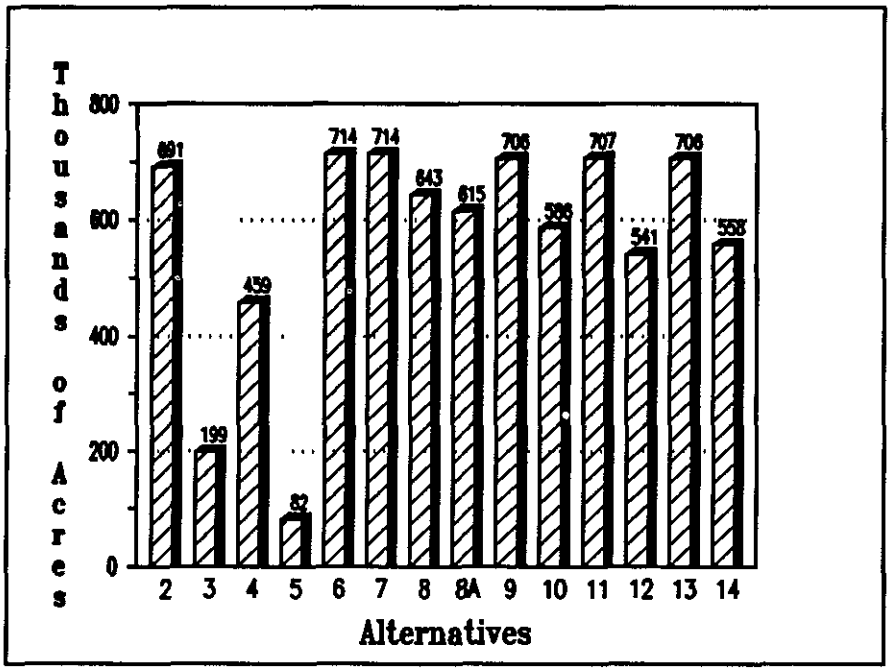


Dispersed Recreation

(Continued)

Graph 2-53 shows the amount of roaded natural ROS settings in each alternative.

Graph 2-53.
Thousands of Acres Managed as Roaded Natural ROS

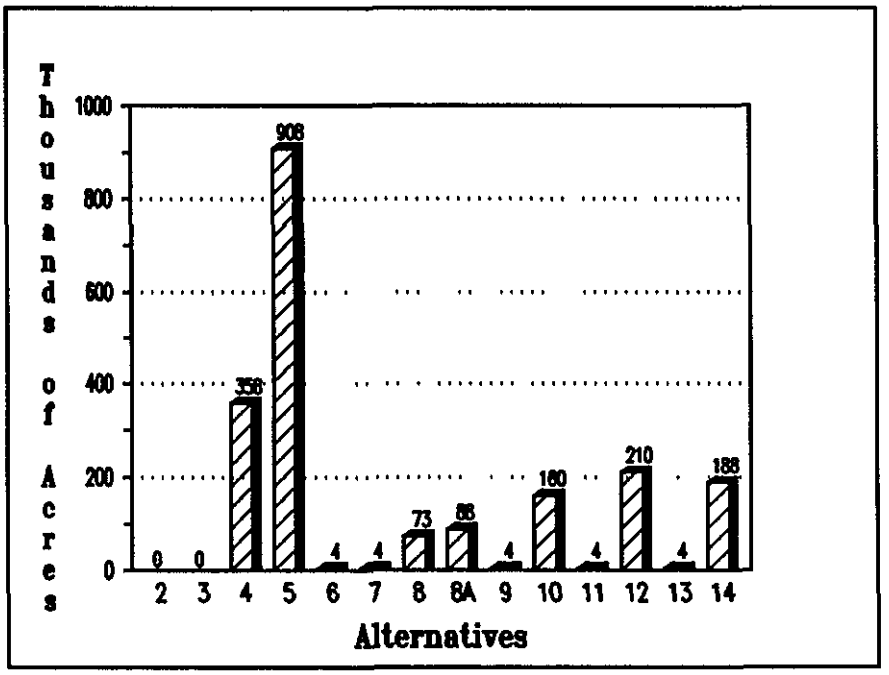


Dispersed Recreation

(Continued)

Graph 2-54 shows the amount of roaded modified ROS settings in each alternative.

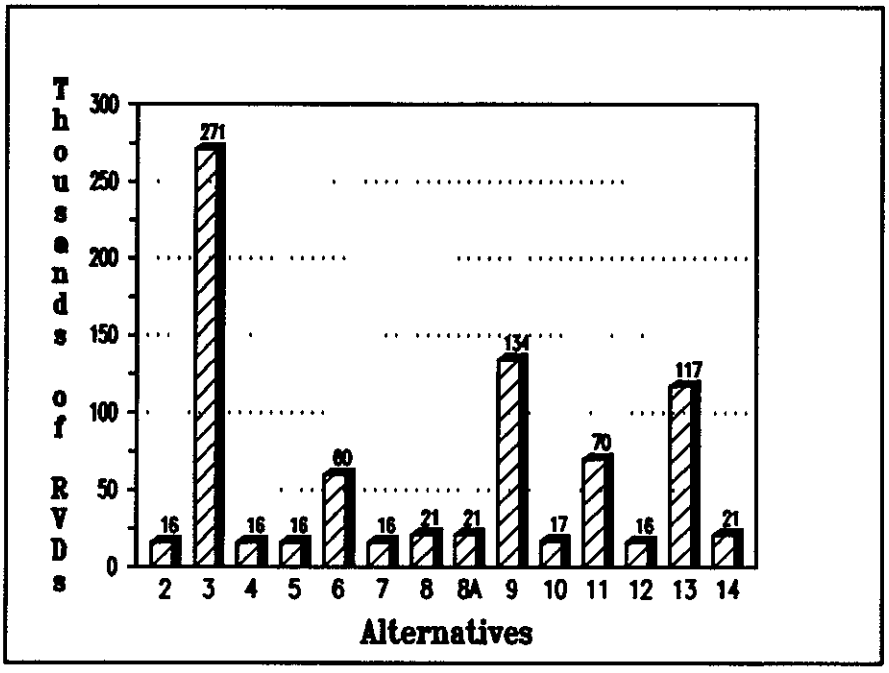
Graph 2-54.
Thousands of Acres Managed as Roaded Modified ROS



Wilderness

Graph 2-55 displays the total wilderness capacity for each alternative if each roadless area recommended for wilderness study were to become wilderness.

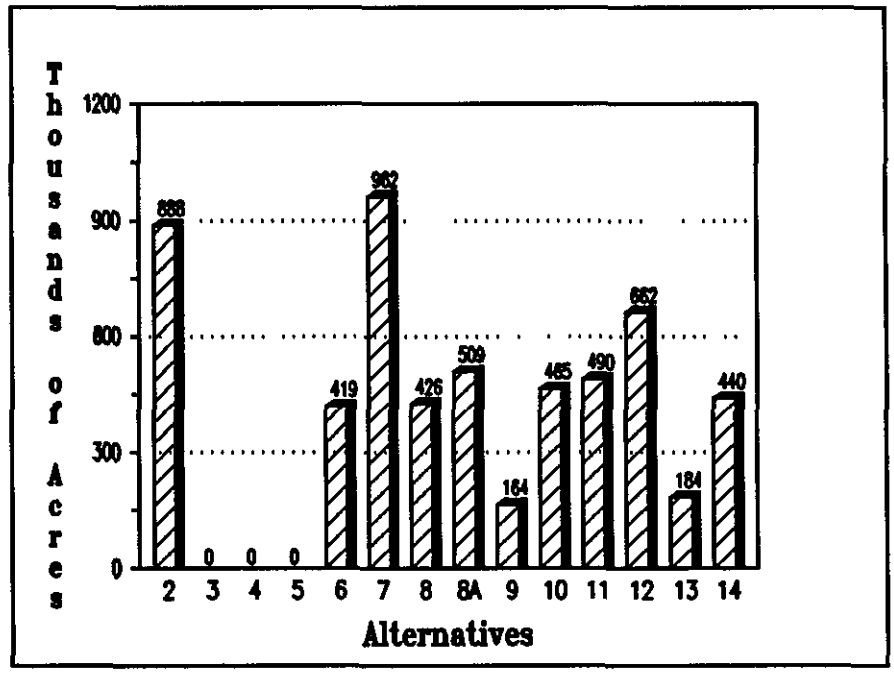
Graph 2-55.
Wilderness Recreation Capacity.



Wildlife

The best indication of the relative degree of emphasizing wildlife management in any of the alternatives is the acreages within three management areas where wildlife management is emphasized. Graph 2-56 displays this information for the 13 alternatives.

Graph 2-56.
Thousands of Acres where Wildlife Management is Emphasized



CHAPTER 3

THE AFFECTED ENVIRONMENT: Before the Alternatives
ENVIRONMENTAL CONSEQUENCES: After the Alternatives

INTRODUCTION

The purpose of Chapter 3 is to present before-and-after views of the Forest environment -- to discuss the environment as it is currently and as it would be if the alternatives were implemented. See "NEPA Requirements Addressed" below for a more complete discussion of the purpose of Chapter 3. The resource discussions begin on page 3-3

NEPA REQUIREMENTS ADDRESSED

This chapter combines the discussions of the "Affected Environment" and "Environmental Consequences" that are required by National Environmental Policy Act (NEPA) implementing regulations (40 CFR 1500). Each resource is first described by its current condition. The descriptions are limited to the background information necessary for understanding how forest plan alternatives may affect the resource The resources listed and their subheadings are designed to address issues raised throughout the planning process

After each discussion of the current condition of a resource, the potential effects (environmental consequences) associated with implementation of each alternative are discussed. All significant or potentially significant effects -- including direct, indirect, and cumulative effects -- are disclosed. Where possible, the effects are quantified. Where this is not possible, a qualitative discussion is presented.

Mitigating Measures

Also, mitigating measures are already incorporated in each discussion of potential effects of the alternatives. Brief descriptions of each alternative and references to the mitigating measures that apply are in Chapter 2 of this document. Reference is made there to detailed information that is part of the process records.

Environmental Consequences: Direct, Indirect, Cumulative

Environmental consequences are the effects of implementing an alternative (with mitigating measures in place) on the physical, social, and economic environment. Direct environmental effects are defined as those occurring at the same time and place as the initial action. Indirect effects are those that occur later than the action or are spatially removed from the activity but would be significant in the foreseeable future. Cumulative effects result from the incremental effects of actions added to other past, present, and reasonably foreseeable actions, regardless ofwhat agency (federal or non-federal) or person undertakes the other actions Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time.

Potential adverse environmental effects which cannot be avoided are discussed. These effects result from managing the land for one resource at the expense of the use or condition of other resources. Many adverse effects can be reduced or mitigated by limiting the extent or duration of effects This is discussed throughout the chapter.

The relationship between short-term uses of man's environment and the maintenance and enhancement of long-term productivity is discussed. Short-term uses (effects) are those that occur annually or within 10 to 15 years of Forest Plan implementation. Long-term productivity refers to the capability of the land and resources to continue producing goods and services for 50 years and beyond.

Irreversible/ Irretrievable Commitments

Irreversible and irretrievable commitments of resources are normally not made at the programmatic level of a Forest Plan. Irreversible commitments are decisions affecting non-renewable resources such as soils, minerals, plant and animal species, and cultural resources. Such commitments of resources are considered irreversible because the resource has been destroyed or removed, or the resource has deteriorated to the point that renewal can occur only over a long period of time or at a great expense. While a Forest Plan can indicate the potential for such commitments, the actual commitment to develop, use, or affect non-renewable resources is normally made at the project level.

Irretrievable commitments represent resource uses or production opportunities which are foregone or cannot be realized during the planning period. These decisions are reversible, but the production opportunities foregone are irretrievable. An example of such commitments is the allocation of management prescriptions that do not allow timber harvests in areas containing suitable and accessible timber lands. For the period of time during which such allocations are made, the opportunity to produce timber from those areas is foregone, thus irretrievable. Irreversible and irretrievable commitments are not specifically identified as such in the discussions contained in this chapter.

Programmatic versus Site Specific

For estimating the effects of alternatives at the programmatic Forest Plan level, the assumption has been made that the kinds of resource management activities allowed under the prescriptions will in fact occur to the extent necessary to achieve the goals and objectives of each alternative. However, the actual location, design, and extent of such activities is generally not known at this time. That will be a site-specific (project-by-project) decision. Thus, the discussions here refer to the potential for the effect to occur, realizing that in many cases, these are only estimates. The effects analysis is useful in comparing and evaluating alternatives on a Forestwide basis, but is not intended to be applied directly to specific locations on the Forest.

AIR

Quality

An air quality monitoring site has recently been installed on Massanutten Mountain. At present, not enough data has been collected from this site to draw conclusions about air quality on the Forest. However, based on monitoring data from surrounding sites, air quality is assumed to meet National Ambient Air Quality Standards (NAAQS). Elevated concentrations of ozone do develop during summer months. Monitors at nearby Shenandoah National Park have recorded levels in excess of the NAAQS during the summer of 1988. Levels experienced at the Park and at James River Face Wilderness on the Jefferson National Forest (which joins the south boundary of the George Washington National Forest) have caused foliar damage to ozone-sensitive species of vegetation, such as sourwood, blackberry, black cherry, and tulip poplar. Similar damage to ozone-sensitive species on the Forest, especially at higher elevations, is assumed to occur.

Visibility

Visibility on the Forest is diminished by air pollution and by naturally occurring by-products emitted from vegetation. Visibility was monitored at Bald Knob on the Warm Springs District from 1985 to 1987. Visibility monitoring results are expressed as "standard visual range." This is the greatest distance that a dark object can be seen against the sky Median standard visual range varied from 33 kilometers (21 miles) in the summer to 92 kilometers (57 miles) in the spring These results are comparable to those found in three years of data collected at James River Face on the Jefferson National Forest and in 10 years of data collected at Shenandoah National Park. Natural background (without any pollution sources) standard visual range for the eastern U S. is estimated to be 150 kilometers (93 miles). Based on this, current levels of air pollution are reducing visibility to about 40 percent of natural visibility.

Effects of the Alternatives

Under **Alternative 3**, three core wildernesses are proposed for designation as Class I air quality areas. These core areas, totaling 55,146 acres, are in the proposed Shenandoah Wilderness, the expanded Dry River-Gum Run-Skidmore-Oak Knob Complex, and the Rough Mountain-Short Mountain-Mill Mountain-Brushy Mountain Complex. Proposed new major air pollution sources and modifications to existing major sources that are within 100 kilometers (62 miles) of Class I areas must be evaluated for their effects on those areas. Most of the zone affected by the new Class I designations is already covered by 100-km zones of existing Class I areas. Designation does, however, add an additional zone of about 14 square miles in Giles County, Virginia, and about 1,080 square miles in West Virginia encompassing portions of Webster, Pocahontas, Nicholas, Greenbrier, Fayette, Summers, and Monroe counties. In all other alternatives, the existing air quality designations are retained.

Smoke from prescribed fire can affect air quality. In **Alternative 3**, prescribed fire is not used. In **all other alternatives**, prescribed fires cause temporary air degradation which may persist for a few hours after the burn. These impacts are short term and localized. Forestwide standards require that smoke management plans be prepared in compliance with the Clean Air Act as Amended 1977 and the regulations for the control and abatement of air pollution for the states of Virginia and West Virginia.

Smoke from wildfire is less manageable in that it occurs under conditions beyond the scope of our control For **all alternatives**, wildfires cause temporary degradation of air quality under adverse weather conditions, particularly when atmospheric conditions favor air stagnation. Wildfires are somewhat more difficult to control under **Alternative 3** due to the decreased access This results in longer periods of air quality degradation due to smoke

CULTURAL RESOURCES

The Forest contains a wide variety of cultural resources, both prehistoric and historic. Ongoing archeological surveys yield the discovery of 1,401 sites These include 1,121 prehistoric and 280 historic sites Five sites are on the National Register of Historic Places (NRHP): the Callie, Catherine, and Mount Torry iron furnaces, the Warwick House, and the Hidden Valley Rock Shelter.

Prehistoric Sites

Prehistoric sites discovered include hunting stations, quarries, quarry/reduction stations, transient camps, base camps, hamlets, villages, and stone burial mounds The majority of sites discovered are lithic scatters -- scatterings of culturally altered pieces of rock -- which are considered to be transient camps.

No confirmed Paleo-Indian occupation has been discovered on the Forest The earliest confirmed occupation began during the Early Archaic period. It began with sporadic use of upland areas with the primary occupation being on terraces and flood plains of major rivers. There was increased use of the upland areas during succeeding periods (Middle and Late Archaic) with a decrease noticed in the later Woodland periods

The introduction of flood plain horticulture followed by agriculture can be offered as an explanation as to why the Woodland populations' use of upland areas decreased. The production of their own food sources reduced the need for hunting and gathering trips into the uplands

Historic Sites

Historic sites are widely represented throughout the Forest. Some of these sites, such as schools and churches, have been identified on topographic maps but have not been located in the field. There are sites of inns or taverns located adjacent to old coach roads recorded in the Forest Known Site Inventory (Rubenstein, 1978); but, again, these have not been checked in the field.

Cabins, house sites, farmsteads, iron furnaces, iron mines, lookout towers, railroads, stagecoach roads, graves or graveyards, CCC camps, iron furnace communities, plantations, colliers' pits (where charcoal was made), Civil War breastworks, Civil War camp sites, cow camps, logging camps, a tannery site, several signal knobs or signalling locations, saltpeter mines, and remains of late-nineteenth century/early-twentieth century resorts have been discovered on the Forest.

Effects of the Alternatives

Cultural resources are protected under **all alternatives.** All areas are surveyed prior to any earth disturbing activities. Eligible sites are nominated to the NRHP.

The possibility of site disturbance due to fire fighting activities exists under **all alternatives.** To the extent practical, an archaeologist will be called to assist in locating fire lines to avoid sites in areas having high probabilities of cultural resource sites.

In **all alternatives**, significant sites will be interpreted for the public as funding allows and demand dictates

Under **Alternatives 2 and 4, 5, 7, 8, 8A, 9, 10, 11, 12, 13 and 14**, survey and evaluation of cultural resources precede all earth disturbing activities and land exchanges. All known sites that are potentially eligible for the NRHP are protected from disturbance. If other sites are discovered during project work, work will be halted until the sites can be properly evaluated.

To the extent that funding allows, general surveys and evaluations are conducted throughout the Forest, including wildernesses. These surveys are non-project oriented and are for the specific purpose of locating and protecting cultural resources.

Alternative 3 accelerates and intensifies these cultural resource general surveys and evaluations in order to locate and protect historic/prehistoric cultural resources in the shortest practical time.

Alternative 3 implements a systematic approach to surveying the entire Forest that is specifically aimed at discovering cultural resources. Areas with known sites are further explored and analyzed for significance and are nominated to the NRHP, as appropriate. Areas with high probability for having significant sites are identified and surveyed. Discoveries are immediately analyzed for significance.

Since management activities are limited in **Alternative 3**, it has the least probability of disturbing sites that are eligible for nomination to the NRHP.

DEVELOPED RECREATION

Forest developed recreation facilities have a combined capacity of 13,820 people-at-one-time (PAOT). All developed recreation sites offer at least a minimum of constructed facilities. These range from small trail shelter sites to large recreation complexes offering flush toilets, swimming beaches, and electricity hook-ups To provide a format for discussion of existing developed recreation, facilities are divided into three categories· major recreation complexes - areas that offer a wide range of opportunities with extensive use of constructed facilities; minor recreation areas - small areas, many including only one site with minimal use of constructed facilities; other developed recreation sites - specialized sites developed to offer a particular activity or focus.

Major Complexes

There are six major developed recreation complexes on the Forest Access to all areas is by paved road All areas offer both day-use and camping facilities. These areas are often destination recreation areas for visitors. Visitors spend more than just an afternoon or a night at these areas. Some return year after year to the Forest. Individual areas are discussed below.

Dry River Ranger District

Brandywine Recreation Area - This area in Pendleton County, West Virginia, offers a day-use area with picnic tables and a swimming beach on a small flood control lake. There is a 30 unit family campground. Vault and chemical toilets are in the day-use area. Warm showers and flush toilets are offered in the campground.

Todd Lake Recreation Area - This area in Augusta County, Virginia, offers a day-use area with picnic tables and a swimming beach on a small lake. There is also a 15 unit family campground. Both sites offer flush toilets and the campground has warm showers. This is the smallest of the major areas on the Forest.

Lee Ranger District

Elizabeth Furnace Recreation Area - This major recreation complex in Shenandoah County, Virginia, is the national forest recreation facility nearest to Washington, D.C. The 25 unit picnic area offers a shelter and vault toilets. There is a 30 unit family campground with flush toilets and warm showers. A group camping area can accommodate 150 people in three groups. The entire area is served by a recently reconstructed water system. A small log cabin constructed in the iron furnace era is used as an interpretive center.

Trout Pond Recreation Area - This Hardy County area is the largest developed recreation area offered by the Forest in West Virginia. The large day use site offers picnicking, swimming, fishing, and boating on Rockcliff Lake and on the

only natural pond in West Virginia, Trout Pond A shelter is available for group picnic use. The entire area has flush toilets. Warm showers are offered in the three campground bathhouses and in the beach bathhouse. Recent rehabilitation has upgraded many facilities at Trout Pond. Electric hookups have been installed in several campsites All bathhouses and toilet buildings will be made fully accessible to people with disabilities

Pedlar Ranger District

Sherando Lake Recreation Area - This Augusta County, Virginia, area was constructed by the Civilian Conservation Corps (CCC) in the 1930s. It offers 65 family campsites and can accommodate 125 people in the group campground. The largest and most heavily used beach on the Forest is located on the lower of two reservoirs. A newly renovated CCC era stone and log bathhouse offers warm showers and flush toilets. An interpretive center, family and group picnicking facilities, and an amphitheater are available

James River and Warm Springs Ranger Districts

Gathright Dam and Lake Moomaw Recreation Area - This area is the largest recreation complex on the Forest. It is developed around a 2,530-acre reservoir that is the largest flat water lake in western Virginia Authorized by Congress in 1947, the area was constructed in the 1970s by the U.S. Army Corps of Engineers All facilities except Gathright Dam and a visitors center were transferred to the Forest Service in 1981. Extensive renovations to the water and sanitation systems are complete on both ends of the lake. All areas have running water and all bathhouses have warm showers.

The Bolar Mountain and Bolar Flat developments in Bath County, Virginia, are operated by the Warm Springs Ranger District. Bolar Mountain has three full-service campgrounds with 90 family campsites Electricity hookups are available at 20 campsites. The large beach area has a bathhouse with warm showers and flush toilets. Near the beach, an amphitheater offers interpretive programs. Picnic facilities are also near the beach. The nearby Bolar Flat development offers picnicking, a boat launch facility, and a full-service marina. Less developed camping facilities without flush toilets are available on the north end of the lake at Greenwood Point and McClintic Point.

The south end of Lake Moomaw, operated by the James River Ranger District in Alleghany County, Virginia, has a 55 unit family campground at Morris Hill. Picnicking facilities are available at Morris Hill and Coles Point A newly developed boat launch is open at Coles Point adjacent to a new beach and bathhouse Group picnic shelters are offered at Coles Point The Fortney Branch boat launch ramp is at the southernmost end of the lake and is the most popular of the three boat launch ramps on the lake.

Minor Areas

There are 21 minor developed recreation sites on the Forest with a total maximum capacity of 2,064 PAOT. These areas are small and frequently, have gravelled access roads. Fewer conveniences are available for the comfort of the visitors. They do not have showers or flush toilets, but in some areas, water and vault toilets are available. These areas offer activities such as camping, picnicking, canoeing, hiking, and interpretation. Some of the areas have expansion potential.

The minor recreation areas include Mountain House, Braley Pond, Confederate Breastworks, North River, Hone Quarry, Blue Hole, Camp Run, Locust Springs, Bubbling Springs, Hidden Valley, Blowing Springs, Little Fort, Hazard Mill, High Cliff Canoe Camp, New Market, Hawk and Wolf Gap.

Other Sites

These sites are developed around particular opportunities or unique sites on the Forest. Most offer only a minimum of amenities for the comfort and convenience of visitors.

Other developed recreation facilities include the Powell's Fort Organization Camp; interpretive sites such as the Massanutten Visitor Center, the National Children's Forest, and the Elizabeth Furnace Cabin; historic sites such as the Warwick Mansion; and observation sites such as the Confederate Breastworks and Crabtree Falls.

Facilities for Disabled

Many existing developed recreation facilities have been constructed or reconstructed to allow access by people with disabilities and there is a continuing program to upgrade all facilities to the extent possible.

Currently, accessible bath houses and toilet buildings are available at Sherando Lake, Bolar Mountain, Trout Pond, and Coles Point swim sites and at Trout Pond, Bolar Mountain, and Bolar Flat day use areas. Accessible vault toilets, either existing or under construction, are located at Elizabeth Furnace, New Market Gap, Bubbling Springs, Braley Pond, and Mountain House picnic areas; North River and McClintic Point campgrounds; Confederate Breastworks observation site; South Pedlar motorized trailhead; and Elkhorn Lake fishing site.

Other accessible facilities include fishing piers at Elkhorn Lake, Bealer's Ferry pond, and at Coles Point on Lake Moomaw. Massanutten Story Trail, Discovery Way, and the National Children's Forest have paved trails that are suitable for use by disabled visitors. All six Ranger District Offices and the Supervisor's Office are fully accessible.

Effects of the Alternatives

The alternatives are discussed here in terms of how the levels of service offered and the amounts of developed recreation available differ from the existing situation. Currently, 1544 acres or 0.146 percent of the Forest is managed with developed recreation facilities. The most land devoted to developed recreation under any alternative is 1891 acres or 0.18 percent of the Forest in Alternative 14. The least is 1540 acres under **Alternative 3.**

Recreation facility construction occurs in all but **Alternatives 3, 6, and 9.** Construction of developed recreation facilities is completed to provide greater service and convenience to users and to harden sites for resource protection, preventing off-site and lessening on-site environmental effects. Facilities which may be constructed, varying by alternative, include roads, buildings, camp sites, family and group picnic sites, interpretive bulletin boards, playgrounds, amphitheaters, and the like.

In **all alternatives**, developed recreation opportunities will be made fully accessible to persons with disabilities to the extent possible in a time frame as funding allows. Necessary rehabilitation or modifications to existing facilities as well as any new or expansion facilities called for under the varying alternatives will be designed and constructed to ensure accessibility.

It is expected that developed recreation facilities will be used by people and associated effects will result from their presence in the Forest With construction of additional developed recreation facilities, there will be such impacts as additional exhaust fumes, noise, runoff from parking lots and roads, vegetation loss, and other effects associated with human presence. However, with new developed facilities, there will be a more than offsetting reduction in resource damage in heavily used dispersed areas and there will be increased user satisfaction for the greatest number of people.

Construction of developed recreation facilities in itself lessens the environmental effects of recreating visitors. Construction is done to limit the impacts of campers to a campground, limit the impacts of picnickers to a picnic area, limit the impacts of rifle range users to the range, and so forth. The construction is a dedication of specific land to a specific use. From a practical point of view, it is a permanent dedication to developed recreation. However, from an environmental aspect, it is realistic to consider that facilities may be removed and areas may be restored to an undeveloped forested environment.

Detailed discussions on the future of lands managed for developed recreation opportunities are contained in process papers for each of the alternatives. A discussion follows, detailing the differences.

Alternatives 2, 4, 5, 7, 11, and 13: Alternative 2 represents the developed recreation program as it now exists on the Forest. The other alternatives offer similar developed recreation programs, with 75 acres of new construction added to current acreage.

Under these alternatives, three major recreation complexes have expansion planned. These are Bolar Mountain, Sherando Lake, and Trout Pond. This expansion is designed to satisfy peak demand that is currently not met. This demand occurs during the summer use season, nearly always on weekends and holidays and quite frequently during the week as well. Currently, visitors are turned away, sent to dispersed areas, or to lesser developed areas if possible. Private sector campgrounds do not offer desired alternatives.

The current level of use in developed recreation sites is estimated at 400,000 RVD's per year. With expansion in place as planned under these alternatives this uses increases by an estimated 26,000 RVD's. The increase represents demand that is currently not met under peak recreation use situations.

Under these alternatives, lands managed for developed recreation opportunities cover 1619 acres.

Alternative 3: This alternative concentrates human use (developed recreation and other areas) on the periphery of the Forest. Existing full-service sites are maintained at a reduced service level. No new construction is planned.

Two areas, Shenandoah Mountain and Locust Springs Picnic Areas, are closed and allocated to lands recommended for wilderness study. If congressional action designates the areas as wildernesses, the facilities will be obliterated.

Closing the two picnic areas will have minimal effects, if any, on the Forest. Their level of use is relatively low and may be diverted to other developed recreation sites or to the dispersed areas of the Forest. Environmental impacts, positive or negative, will be negligible.

This alternative offers 1540 acres in developed recreation, only slightly less than the current program.

Alternative 6 maintains the existing developed recreation program at a full service level with no expansion. To the extent funding allows, amenities such as electric hookups, shelters, and playgrounds are added to existing facilities. No expansion recreation facilities are constructed on the Forest. All facilities are open, safe, and to the extent that funding allows, fully accessible to persons with disabilities. There are 1544 acres in developed recreation areas under **Alternative 6.**

Alternative 8: In this alternative, the expansion program planned under current management and discussed in **Alternative 2** is completed. New camping loops are added to Bolar Mountain, Sherando Lake, and Trout Pond with additional expansion to provide amenities and facilities as demand dictates and funding allows This alternative provides more developed recreation opportunities than **Alternative 2**, but is scaled down in comparison to **Alternative 14**.

Small campgrounds that have facilities for keeping horses overnight are constructed on the Deerfield, Dry River, Lee, and Warm Springs Ranger Districts. However, these areas are not intended to be exclusively for equestrian use. Many are adjacent to areas that offer excellent dispersed recreation opportunities such as hunting, fishing, hiking, and backpacking. These will be minimally developed sites having hand pumps, vault toilets, and no electrical service A larger full service facility for equestrian users will be constructed on the Lee Ranger District.

Hidden Valley and Hone Quarry Recreation Areas are revamped with flush toilets and showers. Group picnicking and camping facilities are added at Hidden Valley.

Full service, highly developed campground loops are added at Elizabeth Furnace on the Lee Ranger District and at Longdale on the James River Ranger District. A minimally developed camping loop is added at Braley Pond on the Deerfield Ranger District.

Group camping facilities are constructed at Morris Hill and McClintic Point on Lake Moomaw.

Parking capacity at Crabtree Falls is increased according to need and to the extent that funding allows

This alternative ultimately offers 1800 acres managed with developed recreation facilities.

Alternatives 8A, 10, and 12: These alternatives offer developed recreation programs that are very similar to Alternative 8 with the construction planned under current management and discussed in **Alternative 2** completed Net acreage at 1812 is slightly more than in **Alternative 8**

Additional minimal service campgrounds with facilities for keeping horses overnight are constructed on the James River and Pedlar Ranger Districts thus giving all six districts such facilities. As in **Alternative 8**, these areas are not intended to be exclusively for equestrian use.

An additional boat-in only campground will be constructed on the north side of Lake Moomaw at Greavers Ridge. This will have minimally developed facilities.

Blowing Springs, the primary overflow area for Bolar Mountain Campground, will be upgraded with a new bathhouse with flush toilets and warm showers as are Hidden Valley and Hone Quarry Recreation Areas. In order to meet overflow RV demands, electrical hookups will be added to Blowing Springs.

Powell's Fort on the Lee Ranger District is managed as a specialized recreation area with emphasis on environmental education rather than as a highly developed site as in **Alternative 8.** The facilities at Powell's Fort will be similar under all alternatives.

Crabtree meadows, now a heavily used dispersed area, will have developed facilities added to harden sites primarily for resource protection and will be managed as a specialized developed recreation site.

Alternative 9 maintains the existing developed recreation program at a reduced service level No expansion recreation facilities are constructed on the Forest. All facilities are open, safe, and to the extent funding allows, fully accessible to persons with disabilities. No additional amenities are added to any sites.

There are 1544 acres in developed recreation in **Alternative 9.**

Alternative 14 has the largest developed recreation program. The expansion program as discussed under **Alternatives 8A, 10, and 12** is completed and additional expansion meets peak demands and enhances facilities for visitors.

Additionally, a small minimally developed campground is constructed at Jerry's Run on the James River Ranger District. Larger expansion programs are completed at existing recreation areas, often with a full range of amenities such as electrical hookups and showers The two boat-in campgrounds on Lake Moomaw, the existing Greenwood Point facility and the proposed Greaver's Ridge facility, are developed to the extent that the available land area allows.

On the Pedlar Ranger District, a new full service recreation area is planned for a site to be determined, most likely in the middle of the District. Development at Crabtree Falls is enhanced with increased parking capacity and an interpretive center A volunteer host site with full utility hookups is added.

Alternative 14 has 1891 acres in developed recreation management.

DISPERSED RECREATION

The Forest accommodates a variety of dispersed recreation activities including backpacking, day hiking, mountain biking, hang gliding, horseback riding, cross-country skiing, boating, sailing, water skiing, hunting, fishing, driving for pleasure, off-highway vehicle and all-terrain vehicle (OHV/ATV) riding, swimming, picnicking, canoeing, camping and gathering of forest products.

Motorized

Driving for pleasure has long been recognized as one of the most popular dispersed recreation activities on national forest lands. The George Washington National Forest is no exception to this rule. Whether it is touring on paved roads and highways, or four-wheeling on rough roads, the Forest offers a variety of experiences to the visitor

The Forest Development Road system totals approximately 1,760 miles. These roads are under the jurisdiction of the Forest Service. In addition, numerous state and federal roads and highways cross national forest lands. Of the Forest Development Roads, approximately 610 miles are open to the public year-round, 440 miles are open seasonally, and 710 miles are closed to public access.

Licensed OHV Use. All roads on the Forest that are open for public travel are open to off-highway vehicle (OHV) use provided the vehicle and the operator are in compliance with state motor vehicle laws. An OHV is defined as a motorized vehicle designed for use off paved roads and includes four-wheel drive vehicles, dune buggies, motorcycles, and ATVs.

Within the Forest public road system, a number of roads provide a challenging off-road experience for licensed OHVs. These forest roads are typically steep, rocky, and/or infrequently maintained. The Forest has identified 161 miles of primitive system roads that offer a challenging experience to four-wheel drive and other licensed OHV users. The Forest has also identified an additional 63 miles of primitive system roads that are seasonally opened to hunters. Appendix J contains a listing of these roads.

Table 3-1 displays the estimated miles of challenging OHV routes available year-round for the fourteen alternatives considered in detail.

Table 3-1.
Miles of Four-Wheel Drive and Other Licensed OHV Routes

Alternative	Miles
2	223
3	0
4	725[1]
5	575[2]
6	105
7	223
8	223
8A	223
9	45
10	223
11	45
12	375[3]
13	45
14	223

[1]Includes 500 miles of system roads presently closed year-round and all seasonally opened roads
[2]Includes 350 miles of system roads presently closed year-round and all seasonally opened roads
[3]Includes 150 miles of system roads presently closed year round and all seasonally opened roads

ATV and Other Unlicensed OHV Use. Use of ATVs and other unlicensed OHVs on Forest lands is regulated by Forest Supervisor's Orders in conjunction with regulations in the Code of Federal Regulations (36 CFR). Unlicensed OHVs are not allowed on Forest Development Roads. They are restricted to trails that are specifically designed and designated as open for their use under individual Forest Supervisor's Orders.

Under current management direction, the Forest has constructed three all-terrain vehicle routes on the Forest:

1. The Taskers Gap/Peters Mill Run trails on the Lee Ranger District contain approximately 20 miles of trails. Additional trails are planned within the Taskers Gap Complex.

2. The Rocky Run complex on the Dry River Ranger District contains 15 miles of trails.

3. The South Pedlar complex on the Pedlar Ranger District contains approximately 25 miles of trails.

To display how the alternatives respond to the ATV issue, Table 3-2 lists, by alternative, the miles and number of ATV Trail Routes.

Table 3-2.
Miles and Number of ATV Trail Routes by Alternative

Alternative	Miles	Number
2	60	3
3	0	0
4	375	19
5	63[1]	3[1]
6	53[2]	3
7	0	0
8	95	5
8A	75	4
9	0	0
10	60	3
11	0	0
12	175	9
13	0	0
14	65	4

[1]No formal ATV routes are scheduled but ATV routes can be designated on a case-by-case basis
[2]This mileage does not include the Peters Mill Run Trail.

Not every ATV trail route may be developed. Many will be unsuitable for development due to degree of slope or other reasons. As a minimum, available areas must meet the criteria for ATV trail developement presented under Issue 4 in the process paper *Addressing Issues and Concerns in the Revision of the Land and Resource Management Plan for the George Washington National Forest.*

Resource impacts associated with ATV and OHV use, such as soil erosion, will be monitored as discussed in the Revised Plan, Chapter 5

Demand For Off-Highway Vehicle Recreational Use. Off-highway vehicle (OHV) use comprises an important part of the motorized recreation opportunities available on the Forest. Based on comments to the draft environmental impact statement, the Forest evaluated the estimated demand for off-highway vehicle recreational use from the current Statewide Comprehensive Outdoor Recreation Plans (SCORP) for Virginia and West Virginia The details of this evaluation are discussed in Appendix B. Table 3-3 displays the estimated demand in miles for four wheel and motorcycle off-road use for the Forest

Table 3-3.
Estimated Demand for OHV Recreation Opportunities
in Miles of Road or Trails

	Demand		
OHV Activity	1990	2000	2010
Four Wheel	236	247	258
Motorcycle	138	144	153
TOTAL	374	391	411

Table 3-4 shows the estimated supply of four-wheel drive routes and ATV routes as a percentage of the estimated demand for the year 2000.

Table 3-4.
4-Wheel Drive and ATV Routes as a Percentage of Estimated Demand by Alternative

Alternative	Licensed	Unlicensed
2	65%	42%
3	0	0
4	294%	260%
5	233%	—[1]
6	43%	36%
7	65%	0
8	65%	66%
8A	65%	52%
9	18%	0
10	65%	42%
11	18%	0
12	152%	122%
13	18%	0
14	65%	45%

[1]No formal ATV routes are scheduled but ATV routes can be designated on a case-by-case basis

Access for Disabled Persons. Under current management direction, approximately two miles of the Neal Run Trail on the Warm Springs Ranger District are open for motorized use by persons with disabilities during hunting season.

Most Ranger Districts have a program to provide hunting access to physically disabled hunters. Qualifying hunters will be permitted to drive and park on specific gated roads where vehicular traffic is normally not allowed. Hunters who possess a valid Virginia or West Virginia permit will qualify for this program. Additional information is available from the Ranger District and state agencies.

Scenic Byways. There is one designated National Forest Scenic Byway on the Forest. The Highlands Scenic Tour, located on the James River Ranger District, is a 19.6-mile loop following State Route 850, Forest Development Road 447 and State Route 770. It is accessed from Interstate 64 at exits 35 and 43. The concept plan for the Highlands Scenic Tour outlines the management of the scenic, cultural, and forest resources involved and how to interpret them for the public.

Non-Motorized

The Forest trail system includes approximately 950 miles of trails designed for a variety of nonmotorized uses and levels of difficulty. The majority of these trails are for general hiking, horseback riding, mountain biking, backpacking and other non-motorized uses. Most are linear trails that are linked by short side trails to form loops of different lengths.

Three trails, the Massanutten Story, Discovery Way, and Children's Forest trails, are paved to provide easy access for visitors in wheelchairs and others who want or require a smooth-surfaced trail The Massanutten Story and Lion's Tale trails offer educational experiences to visitors. Trail systems provide access to the Forest's four wildernesses

Three trails are components of the National Trails System. the Appalachian Trail (AT), the Lion's Tale Trail, and the Wild Oak Trail. Both the Lion's Tale and the Wild Oak trails are National Recreation Trails. The Lion's Tale Trail is a 0.3-mile loop trail designed for use by the visually impaired. The Wild Oak Trail is a 25.6-mile loop trail designed primarily for backpacking and day hikes with no motorized use. The Appalachian Trail is a National Scenic Trail that runs from Georgia to Maine. The approximately 60 miles of the AT that are on the Forest cross the Pedlar Ranger District.

Appendix B of the Revised Plan contains a list of future trail construction/ reconstruction projects for the Forest. These projects have been identified by ranger district personnel as needed to complete components of the Forest system. While additional opportunities and needs will arise in the future, Appendix B presents a good starting point The list does not vary by alternative; however, the priority for constructing the individual trails will change.

Priorities for construction of individual trails will change based on the needs and demands of the public. For example, there might be a significant increase in the demand for short interpretive loop trails over the next few years This demand could shift to linear, long distance trails or to barrier-free trails at some point in the future, thereby changing the priority assigned to the individual trails.

Trail construction projects will be selected on an annual basis depending on available funding, direction in the Forest Plan, and current public demands.

Recreation Opportunity Spectrum (ROS)

The Recreation Opportunity Spectrum (ROS) offers a framework for understanding the relationships between different physical settings and recreation experiences. The Spectrum has been divided into six major classes: Rural, Urban, Roaded Natural (RN), Semi-Primitive Motorized (SPM), Semi-Primitive Nonmotorized (SPNM), and Primitive (P). From a dispersed recreation standpoint, the following discussion is concerned with the Roaded Natural, Semi-Primitive Motorized, Semi-Primitive Nonmotorized and Primitive classes. The Rural and Urban ROS classes apply to developed recreation.

In order to address several key issues raised during the planning process, the Forest has further subdivided the Roaded Natural class Under the Roaded Natural class, the two subclasses are Roaded Natural (RN) and Roaded Modified (RM). RN areas are managed under a visual quality objective (VQO) of partial retention, retention or preservation RM areas are assigned a VQO of modification and are open to a full spectrum of management activities

For a complete definition of all the classes, subclasses and associated recreation experiences, refer to Appendix G.

To estimate the mix of dispersed recreation activities available under each of the alternatives, Table 3-5 on the next page displays the number of acres by ROS class for each alternative.

Alternative 2 represents the current inventory. Therefore, no sub-classes of roaded natural are displayed.

No acres are listed under the Primitive ROS class in Table 3-5. Based on the classification criteria for Primitive, no areas on the Forest qualify for this designation. The Rural and Urban ROS classes are also missing because all recreation occurring on these lands is classified as developed recreation These areas are discussed in the DEVELOPED RECREATION section.

Table 3-5.
Thousands of Acres by Recreation Opportunity Spectrum Class by Alternative

Alternative	Roaded Modified	Roaded Natural	Semi-Primitive Motorized	Semi-Primitive Non-Motorized
2	0	691	203	167
3	0	199	0	862
4	358	459	181	63
5	908	82	32	39
6	4	714	134	209
7	4	714	271	72
8	73	643	213	132
8A	88	615	208	150
9	4	706	14	337
10	160	586	194	121
11	4	707	153	197
12	210	541	226	84
13	4	706	39	312
14	188	558	161	154

Table 3-6.
Millions of Recreation Visitor Days (RVDS) Capacity By Recreation Opportunity Spectrum Class (Including Wilderness) by Alternative

	Alternative													
ROS Class	2	3	4	5	6	7	8	8A	9	10	11	12	13	14
ROADED														
Roaded Modified	0	0	157	418	0	0	22	25	0	71	0	63	0	78
Roaded Natural	344	9	234	56	352	337	330	311	314	299	325	286	309	269
SEMI-PRIMITIVE MOTORIZED	2 7	0	29 2	0 5	2 1	4 2	2 2	3 0	0	3 1	2 4	3 5	0 6	2 6
SEMI-PRIMITIVE NON-MOTORIZED	2 3	55.4	0 5	0 9	2 0	0 7	2 4	2 0	2 9	1 5	1 8	0 9	2 9	1 9
WILDERNESS	0.2	27.1	0 2	0 2	0 6	0 2	0 2	0 2	1 3	0 2	0 7	0 2	1.2	0 2

Table 3-6 on the previous page displays the recreation visitor day (RVD) capacity for each alternative. RVD capacity is stated in total capacity for the first decade of the Revised Plan. The wilderness opportunities are also displayed since they occur on lands classified as roaded natural and semi-primitive non-motorized in existing wilderness and roadless areas recommended for wilderness.

Demand for Recreational Opportunities

Demands for both motorized and non-motorized recreation experiences are high. People come from the mid-Atlantic region to backpack, horseback and mountain-bike ride, participate in OHV activities, and to day-hike on the Forest's developed trail system. The recreation opportunity spectrum provides a method to assess the capacity of lands on the Forest to provide recreation opportunities in different settings compared to the anticipated demand for these opportunities. Table 3-7 displays the anticipated demand for recreation experiences by ROS. The demand for wilderness opportunities is also included.

Table 3-7.
Anticipated Dispersed Recreation Demand by ROS Class (including Wilderness) in Millions of Recreation Visitor Days

Period	Roaded Natural	Semi-Primitive Motorized	Semi-Primitive Non-Motorized	Wilderness
1990-2000	13 9	1.0	0.6	0.1
2001-2010	15.4	1.1	0.7	0 1
2011-2020	17.0	1.2	0.7	0.2

Table 3-8 on the next page compares the capacity for recreation opportunities in Table 3-6 with the demand for recreation opportunities in Table 3-7. The "roaded" category includes both roaded modified and roaded natural. The semi-primitive motorized category includes all three subclasses.

The percentages displayed are capacity as a percent of demand. These numbers merely indicate whether the allocation of lands to different management areas will have a consequence on the ability of an alternative to provide dispersed recreation opportunities in different settings. They do not necessarily mean that sufficient recreation opportunities might be available under any alternative. For instance, the fact that there is sufficient semi-primitive motorized ROS capacity is meaningless if there are insufficient OHV roads and trails present to accommodate OHV demand.

Table 3-8.
Recreation Capacity as a Percentage of Demand by ROS Class (including Wilderness)

Alternative	Roaded	Semi-Primitive Motorized	Semi-Primitive Non-Motorized	Wilderness
2	2473%	260%	385%	123%
3	650%	0	939%	2085%
4	2809%	281%	88%	123%
5	3420%	50%	69%	123%
6	2528%	208%	332%	462%
7	2421%	401%	115%	123%
8	2526%	217%	398%	162%
8A	2414%	286%	346%	162%
9	2253%	18%	490%	1031%
10	2658%	301%	252%	131%
11	2334%	232%	308%	538%
12	2509%	340%	149%	123%
13	2218%	56%	490%	900%
14	2492%	242%	329%	162%

Table 3-8 demonstrates that the amount of lands needed to accommodate the demand for different recreation settings is rarely a concern Only alternatives, such as 3, 4, 5, 9 or 13, that eliminate or severely reduce either the semi-primitive motorized or semi-primitive non-motorized ROS classes cause any shortage of specific settings. It is also obvious that there is an abundance of the roaded ROS settings.

Effects of Alternative 2

Alternative 2 provides for a mixture of dispersed recreation that includes both motorized and non-motorized uses

In terms of **motorized dispersed recreation**, driving for pleasure on the Forest is available for passenger car and OHV/ATV use. The existing Forest Development Road system is expanded to support timber and wildlife management activities primarily. Ninety percent of newly constructed roads are closed to public vehicles.

Regarding opportunities for OHV use, all Forest Development Roads suitable for licensed four-wheel drives (refer to Appendix J) remain open. In addition, areas allocated to Management Area 16 are available for the development of OHV/ATV trails on a case-by-case basis.

The following areas are managed with a focus on **nonmotorized dispersed recreation**. Lake Moomaw, Crab Tree Falls, the Appalachian Trail corridor, existing wildernesses, Big Schloss, and the corridors surrounding rivers eligible for wild and scenic river designation.

Comparing the **ROS class acre distribution** in Alternative 2 to the current ROS inventory shows a substantial decrease in SPNM acreage. This reduction is a result of allocating roadless areas to timber or wildlife management areas where road construction is allowed. The SPM component shows significant increases while the Roaded Natural acreage increases slightly.

Looking at the acreage distribution by ROS, Alternative 2 contains a relatively large number of acres in Roaded Natural. In these areas, social interaction with other forest visitors is likely. Both motorized and nonmotorized uses might be occurring in the same area. Experiences of solitude and remoteness are relatively scarce.

Areas where nonmotorized recreation in a relatively natural setting is emphasized include the SPM2 and SPNM acreages. Relative to the other alternatives, Alternative 2 provides a moderate amount of acreage and capacity within these two classes Here, the Forest visitor could expect to experience solitude and a feeling of remoteness in a relatively natural setting.

Effects of Alternative 3

Under Alternative 3, emphasis is placed on primitive, nonmotorized dispersed recreation.

In Alternative 3, ATV/OHV use is not permitted. Existing ATV/OHV trails are closed as are many of the Forest Development Roads. **Motorized dispersed recreation** is limited in Alternative 3 to driving for pleasure on the paved county, state, and federal roads and highways that remain open.

From a **nonmotorized dispersed recreation** standpoint, many of the existing trails designed for nonmotorized use are allowed to deteriorate. Cross country travel is the rule, whether for hunting, hiking, backpacking, horseback riding, or fishing Trails that are maintained are located in and around developed recreation areas in order to concentrate the impacts of human recreation use.

Numerous areas are recommended for wilderness study. Additional areas serve as migration corridors that connect these wilderness study areas While trails are not generally maintained, these areas will attract Forest visitors who can travel lightly with their supplies on their backs.

A comparison of **ROS class acre distribution** in Alternative 3 to the current ROS inventory shows a fourfold increase in SPNM acreage. The increase is a result of closing Forest Service roads. The semi-primitive motorized component

decreases to zero acres in Alternative 3; the Roaded Natural acres are substantially reduced.

From an ROS standpoint, most of the Forest is allocated to the SPNM ROS class. The remaining Forest acres are classified as Roaded Natural and include those areas located close to federal, state, and forest roads that remain open for public use. Roaded Natural areas are managed to achieve as primitive a setting as possible.

Under Alternative 3, experiences of remoteness and solitude are prevalent as fewer visitors travel to the interior of the roadless areas that are recommended for wilderness study. With little to no timber management, the Forest gradually takes on a natural appearance.

Effects of Alternative 4

The dispersed recreation emphasis in Alternative 4 is on motorized dispersed recreation. This includes travel by passenger vehicles and by licensed and unlicensed OHVs.

A variety of OHV experiences are included. As displayed in Table 3-1, 725 miles of Forest Development Roads are designated as four-wheel drive and other licensed OHV routes. Nineteen one-day riding complexes are constructed. These consist of short loop trails as well as longer loops that take a full day to ride Many of these trail systems are built to accommodate four-wheel drive vehicles as well as ATVs and motorcycles.

Alternative 4 provides for **nonmotorized dispersed recreation** only when it does not conflict with motorized recreation opportunities. Select trails, including but not limited to the Appalachian Trail and the Wild Oak Trail, remain off-limits to motorized use. Nonmotorized use is emphasized and/or provided in Little River, the four wildernesses, and the corridors surrounding the rivers eligible for wild and scenic river designation.

A comparison of **ROS class acre distribution** under Alternative 4 to the existing ROS inventory shows a significant decrease in SPNM acreage. In this alternative, roads for motorized recreation are built in many of the SPNM areas. The Semi-Primitive Motorized component decreases slightly; Roaded Natural acres increase.

Seventy-seven percent of the Forest is in the roaded ROS categories.

As displayed by ROS in Table 3-8, experiences of remoteness and solitude are minimal in this alternative; interactions among forest visitors are relatively frequent.

Effects of Alternative 5

Under Alternative 5, dispersed recreation emphasizes motorized recreation and other activities that occur in roaded settings.

In **Alternative 5**, the development of **motorized dispersed recreation** is permitted in Management Area 17 which is allocated to 85 percent of the Forest. Roads are linked with existing trails to form large loops for motorized use

Nonmotorized dispersed recreation is emphasized and/or provided in several locations. The Appalachian Trail corridor, Lake Moomaw, Big Schloss, Crabtree Falls, Dolly Anne Hollow, Little River, Mount Pleasant, Skidmore, existing wildernesses, and along the eligible wild and scenic river corridors.

Comparing the **ROS class acre distribution** under Alternative 5 to the current ROS inventory shows a large decrease in the SPNM acreage. This reduction is a result of adding roads for timber and/or wildlife purposes in areas currently inventoried as roadless. The SPM component decreases substantially. The large increase in RN acres reflects the timber and wildlife habitat management emphases of the alternative.

In terms of **ROS**, the acreage distribution presented in Table 3-5 indicates that most of the Forest is included in the two classes (RN and RM) where roads and motorized recreation can occur.

With an emphasis on the production of timber and on providing motorized recreation opportunities, experiences of solitude and remoteness are relatively few when compared to other alternatives. The dispersed recreation capacity is concentrated in the Roaded Natural and Roaded Modified areas. Here, the probability of interaction with other forest visitors is high.

Effects of Alternative 6

Under Alternative 6, the Forest is managed in a manner that emphasizes the production of nonmarket goods and services including wilderness, fish and wildlife, water, and both motorized and nonmotorized dispersed recreation.

In Alternative 6, **motorized dispersed recreation** is allowed on open system roads including 105 miles that offer challenging opportunities to licensed OHV users. ATV opportunities are limited to three existing ATV routes (the Taskers Gap trail system on the Lee Ranger District and the Rocky Run and South Pedlar areas on the Dry River and Pedlar Ranger Districts respectively).

Several areas within the Forest are managed with an emphasis on **nonmotorized dispersed recreation.** These include the Appalachian Trail corridor, numerous back country areas (Management Area 9), the corridors surrounding the eligible wild and scenic rivers, the area around Lake Moomaw, Crabtree Falls, and Mount Pleasant.

In addition, several areas are managed in such a way that they provide ideal conditions for primitive nonmotorized dispersed recreation These include the four Forest wildernesses and 11 roadless areas recommended for wilderness study. Wilderness study areas include Adams Peak, Mount Pleasant, St. Mary's Addition, Three Ridges, and Three Sisters on the Pedlar District; Big Schloss on the Lee District; Jerkemtight and Ramseys Draft Addition on the Deerfield District; Little River on the Dry River District; Rough Mountain Addition on the Warm Springs District; and Mill Mountain on the Warm Springs and James River districts. Areas suitable for primitive dispersed recreation also include the 84,000 acres managed as migration corridors (MA 2).

Comparing the ROS class acre distribution under Alternative 6 to the current inventory shows an increase in the areas classified as SPNM. A corresponding decrease occurs in the Roaded and SPM categories To achieve this increase in the SPNM acreage, Forest Development roads are closed in areas where they are not compatible with the management area direction For example, this would be the case in areas allocated to migration corridors (MA 2)

The largest percentage of acres are classified as Roaded Natural. In these areas, a variety of motorized and nonmotorized dispersed recreation activities takes place in combination. Use is relatively high, allowing social interaction and contact among visitors.

With a number of areas allocated to wilderness study, migration corridors and back country areas, Alternative 6 provides increased opportunities to participate in primitive, nonmotorized dispersed recreation activities Relative to the current situation, chances to experience solitude and remoteness are higher

Alternative 6 offers a mix of both primitive and more-developed dispersed recreation activities. Relative to the current situation, it results in a slight decrease in ATV opportunities due to closure of the Peter's Mill Run Trail on the Lee Ranger District

Effects of Alternative 7

Management of habitat for the diverse flora and fauna found on the Forest is the primary concern of Alternative 7

Under Alternative 7, motorized dispersed recreation is somewhat reduced relative to what currently exists on the Forest. The existing ATV/OHV trails are closed to meet the road density criteria associated with Management Areas 14, 15, and 16, which comprise approximately 80 percent of the Forest. No acreage is allocated to Management Areas 11 or 17 where ATV trail development is allowed. As such, ATV use on the Forest is eliminated. The roads listed in Table 3-1 as suitable for OHV use remain open if they do not directly impact proposed, endangered, threatened, or sensitive species. Driving for pleasure occurs on

paved county, state, and federal roads and highways as well as on forest development roads.

Several areas are managed to provide specifically for nonmotorized dispersed recreation use. These areas include the Appalachian Trail corridor, Lake Moomaw, Mt. Pleasant, Crabtree Falls, and the corridors surrounding the rivers eligible for wild and scenic river designation. Existing wildernesses also provide for a variety of primitive dispersed recreation activities. Finally, nonmotorized dispersed recreation occurs in the areas managed to provide habitat for wildlife to the extent that it does not adversely impact the wildlife resource

Comparing the ROS class acre distribution under Alternative 7 to the current inventory shows a large increase in SPM acres as areas currently classified in the SPNM class are accessed with roads for wildlife management purposes. Acres in the Roaded Natural and Roaded Modified categories remain closed to current levels.

As roads are constructed into existing SPNM areas, experiences of solitude and remoteness with no evidence of management activities decrease. A large number of acres and the associated recreation capacity appear in the SPM2 category where roads are closed to public use but are maintained for administrative access. In these areas, experiences of solitude are possible while feelings of remoteness are less likely due to the presence of roads and management activities.

Forestwide, 68 percent of the Forest is classified in the roaded natural category Associated with this acreage is a large dispersed recreation capacity. In these areas, the probability of interaction with other forest visitors is high and experiences of solitude and remoteness are low.

Effects of Alternative 8

The Forest, under Alternative 8, is managed with an emphasis on protection of proposed, threatened, endangered and sensitive (TE&S) species and on maintenance of large areas of unfragmented habitat for area-sensitive species Overall, this alternative favors the development of the nonmotorized dispersed recreation resource

Motorized dispersed recreation is provided in several locations under Alternative 8 ATV and other unlicensed OHVs are allowed on four trail systems and/or areas on the Forest. Two trail systems, Taskers Gap/Peters Mill Run on the Lee Ranger District and Rocky Run on the Dry River District are already open to public use The South Pedlar OHV complex has been approved and is under construction at this time. One additional area on the Deerfield Ranger District -- on Highway 42 near Churchville, Virginia -- has also been allocated for the development of ATV/OHV trails. This represents an increase over the existing

situation. For the most part, the Forest Development Roads listed in Appendix J as suitable for OHV use remain open

Nonmotorized dispersed recreation is favored under Alternative 8. Several areas are managed with an emphasis on developing this resource. They include Hidden Valley, the Appalachian Trail corridor, numerous back country areas (Management Area 9), the eligible wild and scenic river corridors, Crabtree Falls, Hidden Valley, and Lake Moomaw.

Nonmotorized dispersed recreation is also available in the four wildernesses and in the three roadless areas that are recommended for wilderness study. St. Mary's Addition, The Priest, and Three Ridges.

Additional areas are managed for remote wildlife habitat (Management Area 14) Motorized recreation is not allowed in these areas and, while not managed with an emphasis on dispersed recreation, they provide opportunities for primitive nonmotorized recreation.

Comparing the **ROS class acre distribution** under Alternative 8 to the existing ROS inventory shows a 20 percent decrease in SPNM acreage. The SPM component increases slightly. Roaded (RN and RM) acres increase slightly.

Relative to the other alternatives, Alternative 8 contains the ninth highest number of SPNM acres. Within these areas, and in the areas classified as SPM2, the probability of experiencing solitude and a feeling of remoteness is high. Within the areas classified as RN and RM, a variety of dispersed recreation uses is available including motorized recreation on Forest Development Roads and ATV trail systems. This portion of the Forest provides the bulk of the dispersed recreation capacity.

Effects of Alternative 8A

The Forest, under Alternative 8A, is managed to provide a mixture of uses, conditions, services and values consistent with multiple use management under the agency ecosystem management policy.

Motorized dispersed recreation is provided on open system roads and in several specific locations under Alternative 8A. ATV and other unlicensed OHVs are allowed on four trail systems and/or areas on the Forest. Two trail systems, Taskers Gap/Peters Mill Run on the Lee Ranger District, and Rocky Run on the Dry River District are currently open to public use. The South Pedlar ATV system has been approved and is under construction at this time. One hundred sixty miles of Forest Development Roads are featured for OHV use In addition, the Forest Development Roads listed in Appendix J as suitable for OHV use remain open, at least seasonally.

Nonmotorized dispersed recreation is favored under Alternative 8A Opportunities for non-motorized activities such as hunting, hiking, horseback riding, camping, nature study, hang gliding, and wildlife observation are featured in a number of areas. These include numerous backcountry areas totaling 141,000 acres in Remote Highlands (Management Area 9), several dispersed recreation areas such as Hidden Valley (Management Area 13), the Appalachian Trail corridor, four Special Management Areas (Management Area 21), watchable wildlife areas (Management Area 22), and the corridors surrounding the eligible wild and scenic rivers.

A variety of nonmotorized dispersed recreation opportunities are also available in the four wildernesses and in the three roadless areas that are recommended for wilderness study: St Mary's Addition, The Priest, and Three Ridges.

Additional areas are managed for remote wildlife habitat (Management Area 14) Motorized recreation is not allowed in these areas and, while not managed with an emphasis on dispersed recreation, they provide opportunities for primitive nonmotorized recreation.

Comparing the **ROS class acre distribution** under Alternative 8A to the existing ROS inventory shows a slight decrease in SPNM acreage. The SPM component decreases slightly. Roaded (RN and RM) acres increase slightly

Relative to the other alternatives, Alternative 8A contains the eighth highest number of SPNM acres. Within these areas, and in the areas classified as SPM2, the probability of experiencing solitude and a feeling of remoteness is high Within the areas classified as RN and RM, a variety of dispersed recreation uses is available including motorized recreation on Forest Development Roads and ATV trail systems. This portion of the Forest provides the bulk of the dispersed recreation capacity.

Effects of Alternative 9

Alternative 9 recommends a large number of areas for wilderness study and emphasizes unfragmented habitat for wildlife purposes. Under Alternative 9, motorized dispersed recreation is restricted to federal and state roads and highways and forest development roads. Existing ATV/OHV trails are closed and no new trails are constructed. As such, motorized recreation is limited under this alternative.

Given the emphasis of Alternative 9, it follows that nonmotorized dispersed recreation receives priority. Numerous areas and acres are managed to promote primitive dispersed recreation in a natural setting. These areas include the Hidden Valley Scenic area, numerous back country areas totalling 243,000 acres (Management Area 9), the Appalachian Trail corridor, the corridors surrounding the eligible wild and scenic rivers, and the areas surrounding Crabtree Falls, Lake Moomaw, and the Todd Lake/Elkhorn Lake area.

In addition to the areas listed above, 26 areas totalling more than 260,000 acres are recommended for wilderness study. An additional 107,000 acres are allocated to Management Area 2 to serve as migration corridors and to preserve unfragmented habitat. All of these areas, as well as the existing wildernesses, offer primitive dispersed recreation in an unmodified setting.

Examination of the ROS class distribution under Alternative 9 reveals a substantial increase over the current inventory in the number of acres classified as SPNM. This is compatible with the emphasis of the alternative on wilderness and remote wildlife habitat. As the SPNM acreage increases, the number of acres classified as Roaded and/or SPM decreases. This change occurs as roads are closed to meet the standards associated with wilderness study areas and migration corridors

Under Alternative 9, forest visitors experience solitude and a feeling of remoteness as they travel in the numerous wilderness study, scenic, back country, and migration corridor areas. Interaction with other visitors occurs in and around developed recreation sites and at major access points along roads. With the number of acres recommended for wilderness study and the reduced timber management program, the Forest takes on a largely natural appearance over time. The visual impact of timber harvests is reduced through the use of uneven-age harvest methods

Effects of Alternative 10

Alternative 10 emphasizes an above-cost or a least-net-cost timber program coupled with **motorized recreation** in areas where timber is managed

Roads constructed for access to timber are upgraded for OHV purposes Additional construction links designated OHV roads and trails to provide longer riding opportunities and/or to form loop rides where possible Seasonal closures might be necessary to protect the forest resources.

In Alternative 10, several areas are managed to promote **nonmotorized dispersed recreation** The Appalachian Trail corridor remains dedicated to nonmotorized dispersed recreation. Northern Massanutten, Southern Massanutten, Three Ridges, Mount Pleasant, the Friars, and the Priest roadless areas are designated as Scenic Areas. Additions are made to both St. Mary's and Rough Mountain wildernesses. The corridors of rivers eligible for wild and scenic river designation are managed to promote nonmotorized dispersed recreation. A sizeable portion of the Little River roadless area is allocated to Management Area 4A which specifically promotes nonmotorized dispersed recreation. Finally, both Crabtree Falls and Lake Moomaw are dedicated to dispersed recreation.

Comparing the **ROS class acre distribution** under Alternative 10 to the existing ROS inventory shows a sizeable decrease in the SPNM acreage This reduction

is a result of building roads for timber or wildlife habitat management in areas that are currently in the roadless area category. The SPM and RN components increase by small percentages.

In order to access the most productive and profitable timber sites, Alternative 10 adds roads to areas that are currently without roads In most cases, these roads remain open -- at least seasonally -- for motorized recreation purposes.

Relative to the other alternatives, Alternative 10 shows a slight decrease in the SPNM acres and a relatively large number of acres in the SPM2 category. These areas will be the focus for nonmotorized dispersed recreation, where solitude and a feeling of remoteness are available

Effects of Alternative 11

The Forest is managed to provide a strong nonmotorized recreation program. Under Alternative 11, **motorized dispersed recreation** is restricted to federal and state roads and highways and forest development roads. Existing ATV/ OHV trails are closed and no new trails are constructed. As such, motorized recreation is limited under this alternative.

Nonmotorized dispersed recreation is emphasized in several locations on the Forest Nonmotorized dispersed recreation is primarily provided in the existing wildernesses and in the 11 areas recommended for wilderness study (See Table 3-15 in the ROADLESS AREAS section). The remaining roadless areas are managed as back country areas where primitive dispersed recreation activities are available. In addition to these areas, nonmotorized dispersed recreation is featured in the corridors along the Appalachian Trail and the rivers eligible for wild and scenic river designation.

Comparing the ROS class acre distribution in Alternative 11 to the current ROS inventory shows an increase in SPNM acres This increase occurs in the back country (Management Area 9) areas and in the areas recommended for wilderness study where land currently classified as SPM is converted to SPNM through road closures. This increase in SPNM acreage is accompanied by a corresponding increase in the SPNM capacity. Roaded (RM and RN) ROS classes increase somewhat in Alternative 11.

Relative to the other alternatives, Alternative 11 shows a substantial increase in the SPNM component where primitive nonmotorized dispersed recreation is emphasized. It is in these areas that Forest visitors find solitude and experience a feeling of remoteness. As in the other alternatives, the bulk of the dispersed recreation capacity is in the areas classified as Roaded Natural.

Effects of Alternative 12

Motorized dispersed recreation increases substantially under Alternative 12 along with a large decrease in the number of acres devoted to primitive, nonmotorized dispersed recreation.

Nine ATV trail routes can be constructed. Together these areas would contain an estimated 175 miles of trails for unlicensed vehicles Additionally, an estimated 375 miles of Forest Development Roads offer challenging experiences to licensed OHV users.

Alternative 12 manages the following areas for **nonmotorized dispersed recreation**: the Appalachian Trail corridor, Big Schloss, Dolly Ann Hollow; the corridors along the eligible wild and scenic rivers; and 13,378 acres around Lake Moomaw, Crabtree Falls and Mount Pleasant (Management Area 13).

Primitive nonmotorized dispersed recreation is offered in the existing wildernesses. No areas are recommended for wilderness study.

Comparing the **ROS class acre distribution** under Alternative 12 to the current ROS inventory shows an increase in the number of acres classified in the two Roaded categories A corresponding decrease occurs in the number of acres classified as SPNM This switch in acres from SPNM to Roaded or SPM is largely a result of road construction for timber management. Roads constructed for timber management provide access to areas currently inventoried as roadless.

With the majority of the Forest in the Roaded categories, encounters among visitors is relatively frequent Solitude and feelings of remoteness are relatively limited and are found in the Forest's wildernesses and other areas allocated to Management Area 9. Overall, there is a reduction in the natural appearance of the Forest as the timber management program and its associated activities expand.

Effects of Alternative 13

Alternative 13 recommends 21 areas, totalling 213,000 acres, for wilderness study. Additional areas are managed as unfragmented habitat. Timber management occurs on highly roaded lands and, to a lesser extent, on moderately roaded lands.

Motorized dispersed recreation is limited to established roadways. All existing ATV/OHV trails are closed and no new trails are constructed. The number of scenic byways is increased Interpretive facilities are incorporated into these byways to provide educational opportunities for the motoring public.

Management of the **nonmotorized dispersed recreation** resource is emphasized in or around several locations including Crabtree Falls, several back country areas (Management Area 9), Hidden Valley Scenic Area, the Appalachian Trail corridor, the corridors surrounding the eligible wild and scenic rivers, and Lake Moomaw.

In addition to the areas listed above, primitive, nonmotorized dispersed recreation is offered in the Forest's four wildernesses and in the 21 areas recommended for wilderness study.

The **ROS class distribution** for Alternative 13 shows a significant increase in acres classified as SPNM. Most of the increase in SPNM acres comes from areas currently classified as SPM, with a lesser amount from areas classified as Roaded This increase in SPNM acreage is compatible with the number of areas recommended for wilderness study and backcountry designation (Management Area 9).

Under Alternative 13, dispersed recreation users experience solitude and feelings of remoteness in many of the wilderness study and back country areas. Timber management is concentrated in and around areas that are already roaded. In these areas, the Forest's natural appearance is impacted and dispersed recreation users have a greater chance of interacting with other users. Overall, the interior of the Forest retains a natural appearance while areas that are already roaded show evidence of timber, wildlife, and other management activities

Effects of Alternative 14

From a dispersed recreation standpoint, Alternative 14 shows a broad mix of opportunities for both motorized and nonmotorized recreation.

For **motorized dispersed recreation**, Alternative 14 retains all of the Forest Development Roads that appear in Appendix J. Alternative 14 includes all of the existing ATV trail systems and develops an additional system on Brushy Mountain in the James River Ranger District. Alternative 14 provides a relatively limited number of acres for development of ATV trails.

Nonmotorized dispersed recreation is featured or provided in several areas on the Forest including Mt. Pleasant, several backcountry areas (Management Area 9), the eligible wild and scenic river corridors, existing wildernesses, the Appalachian Trail corridor, three wilderness study areas including Three Ridges, The Priest, and St. Mary's addition, and several other areas allocated to Management Area 13.

Nonmotorized dispersed recreation is available on acreage allocated to Management Areas 14, 15, and 16 where wildlife habitat is the driving force.

Comparing the **ROS class acre distribution** under Alternative 14 to the current ROS inventory shows a decrease in SPNM acreage. The SPM component decreases. RN acres increase slightly.

Much of the Forest falls within the RN and RM categories where access is relatively easy and the probability of interaction with other forest visitors is high.

Less emphasis is placed on and fewer acres are allocated to SPNM and SPM2, where solitude and a feeling of remoteness are experienced.

FIRE

Before settlement of this land by what were to become Native Americans, lightning-caused fires were a major force in shaping the vegetation of the southeastern United States, including the Appalachians Depending on the frequency of such fires certain forest types would have been more open than they are now Appalachian forests may not have burned as frequently as the pine-grasslands of the adjacent Piedmont But certain areas -- such as pine-dominated ridgetops -- burned more frequently and more intensely.

After settlement by Native Americans, man-caused fire became a common factor in the grasslands and forests, with burns occurring primarily in the fall and winter -- different from the more intense late spring and summer lightning burns The fires improved habitat for deer and buffalo and made gathering of acorns and chestnuts easier. Also, the burning reduced threats of intense forest fires by clearing underbrush and keeping the forests open.

For primarily the same reasons, periodic burning continued with the early settlers. Also, the early settlers introduced grazing and most likely used fires to increase the production of forage.

These practices continued until the formation of the National Forest System. After the forests became part of the system, a significant reduction in the number of fires was evident.

Fire on the Forest

During the past 10 years on the Forest, an average of 42 fires per year has occurred with an average fire size of 16 acres. During this period, five years of summer drought resulted in a significant increase in lightning-caused ignitions. As a result, the percentage of man-caused ignitions has dropped from 90 percent to 79 percent However, in normal fire seasons, man-caused ignitions account for 90 percent of the total

The natural presence of fire has helped establish fire-dependent ecosystems on the Forest But under the Forest Service policy of fire suppression, wildfire has not been an important agent of change on the Forest and is not expected to be in the foreseeable future. In compliance with Forest Service policy, all wildfires on the Forest will continue to be suppressed with an emphasis on minimizing the fire program costs and the net changes in the value of planned resource outputs due to fire. The fire suppression strategies for each management area will be further described in *The Forest Fire Management Action Plan.*

A number of factors influence the effects of fire on forest resources. Primary factors are weather, forest fuels, and wildland-urban interface. Fuels and wildland-urban interface are factors that are sensitive to management activities proposed in the alternatives.

Forest Fuels

Major factors affecting forest fuels on the Forest are the dominant age of the majority of the timber and the current infestation of gypsy moth.

Most timber is over 80 years old. Consequently, stands have a predominantly open understory with light fuels. The difficulty of fire suppression in the oak types, which are the major forest types, is light to moderate. As the forest ages and trees die, fire suppression will be only slightly more difficult. However, a moderate increase in mop-up difficulty will occur due to an increased amount of large woody materials on the ground.

The gypsy moth poses a whole new situation. Past defoliation has shown that significant mortality can be expected in older oak stands, the species preferred by gypsy moth. As a result of mortality, new dense ground cover establishes itself on the forest floor. This new vegetation significantly increases the amount of fuel available to burn and, in turn, requires greater forces (firefighters, equipment, air support) to suppress fires. If resources are limited, the result is longer duration of fire activity.

Another result of mortality due to gypsy moth is an increase in the amount of dead fuel, both on-the-ground and standing. Standing dead stems in mortality areas are expected to remain for many years. Periodic insect re-infestations add to the situation.

Effects of the Alternatives

Alternatives 3, 9, 11 and 13 similarly treat the Gypsy Moth in that they basically allow no intervention except for specific areas. These alternatives allow the development of fuels beyond what would be expected from all other alternatives. Fires are expected to achieve larger size and have increased suppression costs under these alternatives.

Assuming the gypsy moth damage continues as it has in the past, increased resistance to control of fire is encountered primarily from a large increase in the number of dead stems. **Alternatives 3, 9, 11 and 13** restrict development of roads, thus reducing access for suppression forces. Depending upon conditions, reduced access can significantly increase fire costs and fire size.

In the absence of gypsy moth caused mortality and management activity, the Forest eventually reverts to older age classes. Achieving control of wildfire does not appreciably increase in difficulty. **All alternatives** propose differing amounts of vegetative manipulation, either in the form of commercial timber sales or other practices. Cultural operations increase the risk of fire occurrence, either through equipment fires or accidental ignitions **Alternative 3** proposes the least activity. Fire risk increases proportionate to the level of activity proposed by the alternatives.

Since only a few of the man-caused fires on the Forest are attributed to arson, the frequency of man-caused fires is expected to remain fairly constant and not affected by **any alternative.**

Wildland-Urban Interface

Since the Forest is close to major population centers, private land adjoining or close-by the Forest is being developed for vacation homes and year-round residences. Individual as well as multi-unit developments are being built.

With the combination of more dense ground-cover due to gypsy moth defoliation and more private homes being built close to the Forest, an increase is expected in both the severity and the number of fires. This is due to increased risk caused by a higher level of human activity adjacent to the Forest boundary.

These developments increase the risk for structural and wildland fires and also increase the need for fire suppression forces. If suppression efforts are committed to structure protection, attacks on wildland fires could be delayed. As a result, the risk of wildland acreage losses will increase significantly and property losses may also be significant.

Effects of the Alternatives

Acquiring land inside the Forest boundary that is now privately-owned reduces the number of boundaries shared by the Forest Service and private owners. Reducing the number of shared boundaries -- the interface -- reduces the risk of interface-area ignitions. **Alternative 3** proposes the most aggressive land acquisition program. All other alternatives propose no change from the current level of land acquisition activity.

FISHERIES

The Forest has approximately 1,287 miles of perennial streams. 660 miles are classified as cold water (less than 70 degree water temperatures) and 627 miles are classified as cool or warm water (temperatures greater than 70 degrees during summer months).

Habitats

Water quality in the cold water stream habitat is generally described as infertile with total alkalinity less than 20 ppm, total hardness less than 20 ppm, and slightly to very acidic with pH less than 7.0 and as low as 5.2. Approximately 93 percent of the streams are considered sensitive to acidification Of this 93 percent, 49 percent are considered extremely sensitive and 10 percent are considered acidic Acid deposition coupled with poor natural buffering capacity may have increasingly negative impacts on the fisheries resource.

In addition to the streams, the Forest has 3,190 acres of lakes, ponds, and reservoirs. Lake Moomaw -- the largest body of water on the Forest at 2,530 acres -- contains habitat for both warm water and cold water environments.

Species

The Forest's aquatic habitats support 67 species of game and non-game fish Three species are listed as threatened, endangered, or sensitive: the Potomac sculpin, roughhead shiner, and orangefin madtom. These species are monitored as management indicator species in habitats where they are found.

Common native fish species in the cold water stream environments include brook trout, mottled sculpin, fantail darter, blacknose dace, longnose dace, and torrent suckers. Native brook trout populations are managed as management indicator species in cold water stream environments.

Introduced species such as rainbow trout and brown trout are routinely stocked for sport fishing. In some Forest streams, these species develop into naturalized populations.

Cool/warm water streams across the Forest vary greatly in water quality and productivity. Common game fish species found in cool/warm water stream environments on the Forest include smallmouth bass, largemouth bass, redbreast sunfish, channel catfish, and rock bass. Typical non-game species include white sucker, carp, redhorse sucker, yellow bullhead, and a large variety of minnow species. Members of the Centrarchid (sunfish) family are managed as management indicator species in cool/warm water stream environments.

Lake habitats on the Forest are relatively infertile with limited productivity They routinely contain largemouth bass, bluegill, and channel catfish. Trout species are stocked in lakes that have significant cold water environments. Productivity is often artificially increased through liming and fertilization programs Members

of the Centrarchid family are managed as management indicator species in lake habitats.

Effects of the Alternatives

Management activities in watersheds, particularly in the riparian areas, have the most potential for effects on fisheries and aquatic habitat resources on the Forest. The biggest concerns for aquatic habitats are sedimentation, future sources of large woody debris for self-maintaining diverse habitat components, canopy cover to maintain water temperature regimes, and acid rain. Management areas and riparian management activities vary by alternative. Table 3-9 shows by alternative the general riparian approach and the approximate percentage of riparian areas that are classified as suitable for timber production. Standards for riparian areas vary by alternative.

Table 3-9
General Riparian Area Direction

Alternative	2	3	4	5	6	7	8	8A	9	10	11	12	13	14
Riparian Approach*	1	4	2	2	1	3	3	3	4	3	1	3	1	3
Percentage of Riparian Acres Suitable for Timber Management	0	0	46	66	0	0	18	5	0	9	0	33	0	22

*Riparian Approach.
1 Current management - 100-foot no cut on perennial streams with a 200-foot no-cut zone on featured brook trout streams, current fish management practices
2 Mitigation approach - state Best Management Practices, current fish management practices
3 Resource approach - management activities (including timber) only if it leads to desired future condition of riparian dependent resources
4 Natural processes approach - limited hands-on management, no put-and-take trout program

Sedimentation, large woody debris, canopy cover, and acid rain are addressed differently by alternative and by management area within each alternative. They are addressed either by mitigation, a resource approach (active management to meet desired future conditions), or a natural processes approach (limited active management).

Alternatives 2, 6, 11, and 13 use an approach that resembles current management. There is a no-cut streamside management zone on streams that vary by stream type and slope. Riparian habitats and fisheries are sustained in a healthy condition Timber harvesting occurs only when needed to protect or enhance riparian-dependent resources. A slow progression toward a mature forest of more shade tolerant species occurs. More large woody debris is deposited into streams. Current fish management practices such as stocking, lake fertilization, streambank stabilization, addition of habi-

tat improvement structures, and use of mitigation measures for acid rain are continued in order to increase recreational fishing.

Alternatives 4 and 5 use state BMPs in riparian areas that are classified as suitable for timber production. In suitable timber lands, a mitigation approach is used to attain a desired future condition for riparian areas. Current fish management practices such as stocking, lake fertilization, streambank stabilization, habitat improvement structures, and mitigation measures for acid rain are continued in order to increase recreational fishing.

Alternatives 7, 8, 8A, 10, 12, and 14 use a resource approach where riparian areas are managed as a separate management area based on ecological parameters. This will, through management, speed the processes that maintain or lead to a desired future condition for fisheries and aquatic habitats. Riparian habitats and fisheries are sustained in a healthy condition. Timber harvesting occurs only when needed to protect or enhance riparian-dependent resources. A slow progression toward a mature forest of more shade tolerant species occurs. More large woody debris is deposited into streams. Current fish management practices may be suitable such as stocking, lake fertilization, streambank stabilization, use of habitat improvement structures, and use of mitigation measures for stream acidification.

Alternatives 3 and 9 use a natural processes approach, excluding most management activities, to attain a desired future condition in riparian areas. Many fish management activities such as stocking, habitat improvement, and mitigation are restricted or prohibited.

Under **Alternative 3**, the biggest change from current management occurs. Fisheries habitats function naturally with limited management activity in riparian areas. The trout stocking program is eliminated. The elimination affects 157 acres of Forest lakes and ponds, 110 miles of streams, and Lake Moomaw.

Initially under Alternative 3, a significant decrease occurs in recreational fishing days spent on the Forest. (According to 1986 figures, 124,603 fish-user-days were spent on stocked trout fishing on the Forest.) The Forest ponds and lakes currently stocked with trout also maintain viable warm-water sport fisheries that continue under this alternative. Riparian areas under this alternative lead -- through natural processes -- to improved fisheries habitats that are diverse and self-maintaining.

INSECTS AND DISEASES

Insect and disease organisms are a significant component of forest ecosystems. These organisms contribute to many ecological processes of forests including nutrient cycling, plant succession, and forest dynamics. In most cases, these organisms are recognized as integral components of forests. In a few instances, these organisms cause unacceptable resource damage or loss and adversely impact ecological, economic, or social values. In the latter instances, the organisms causing the damage are referred to as pests.

Major insect pests include the gypsy moth and the southern pine beetle. Minor insect pests include the hemlock woolly adelgid, twolined chestnut borer, and a variety of defoliators, such as the oak leaftier, pale tussock moth, fall cankerworm, buck moth, various oakworm species, and several species of loopers. Major disease problems include oak decline, dogwood anthracnose, shoe-string root rot, and a variety of decay organisms affecting living trees.

Forest pest problems may develop around an interaction of stress factors that act simultaneously or sequentially. These factors may include forest stand and site conditions, predisposing factors such as drought or prior abiotic and biotic damage, and the interaction or cumulative impact of pest complexes. The most serious pest complex on the Forest is oak decline and gypsy moth. A majority of oak stands on the Forest are in the older age classes and have been subjected to extended periods of drought stress during the 1980s. Ice and hail damage and an outbreak of native defoliators contributed to the stress. This complex interaction of stand age, site conditions, and these various predisposing factors is contributing to the high incidence of oak decline on the Forest (Oak et al., 1990). With the appearance and spread of gypsy moth, the cumulative impact of this pest complex on the Forest will be significant. The amount of damage observed over the next ten years will eflect the underlying decline of oak stands, the added stress of repeated gypsy moth defoliation, and the action of secondary pests. Furthermore, the underlying factors that contribute to the expression of oak decline in forest stands will not be improved by the management of gypsy moth populations alone.

Gypsy Moth

The gypsy moth was first reported causing defoliation on the Forest in 1986. Currently, it is at outbreak population levels across a wide swath of the Forest. Hardwood foliage, especially leaves of various species of oak, is the preferred diet of the gypsy moth caterpillar. Since hardwood stands occur on about 80 percent of Forest acreage and because the health of many of these stands is impaired by oak decline, the gypsy moth will cause dramatic impacts across the entire Forest. These impacts include loss of foliage, loss of hard mast, and the death of trees. It is generally held that trees which are stressed by gypsy moth defoliation, and subsequently die, are killed by

secondary pests, such as the two-lined chestnut borer and the shoe-string root rot fungus.

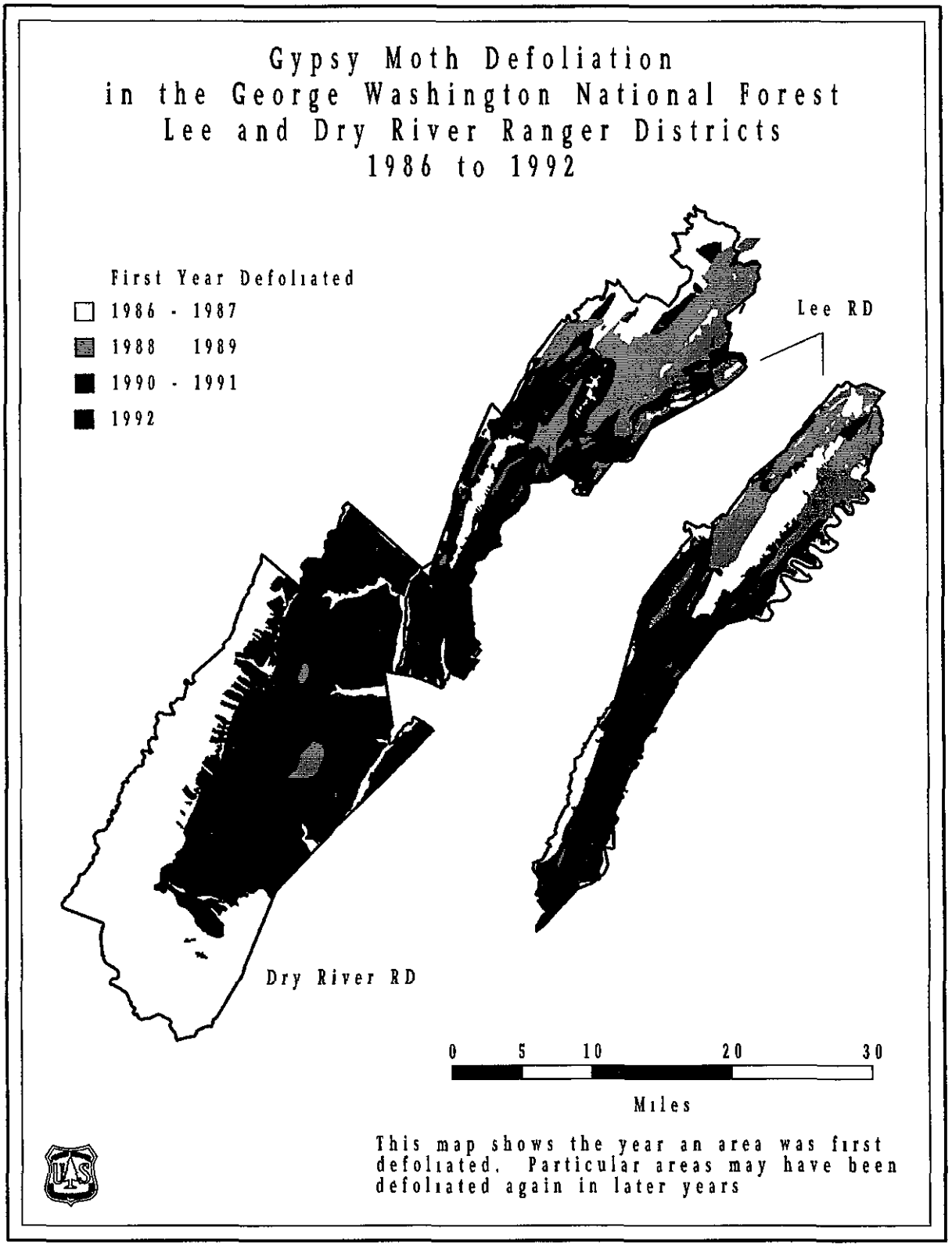
Under natural conditions, gypsy moth populations increase to outbreak levels, cause severe defoliation for one to three years, and collapse to inconspicuous levels for several years. The population collapse is usually caused by a virus, called nucleopolyhedrosis virus or NPV. However, sometimes the collapse may result when caterpillars rapidly consume all acceptable foliage and then die from starvation before they can complete their development.

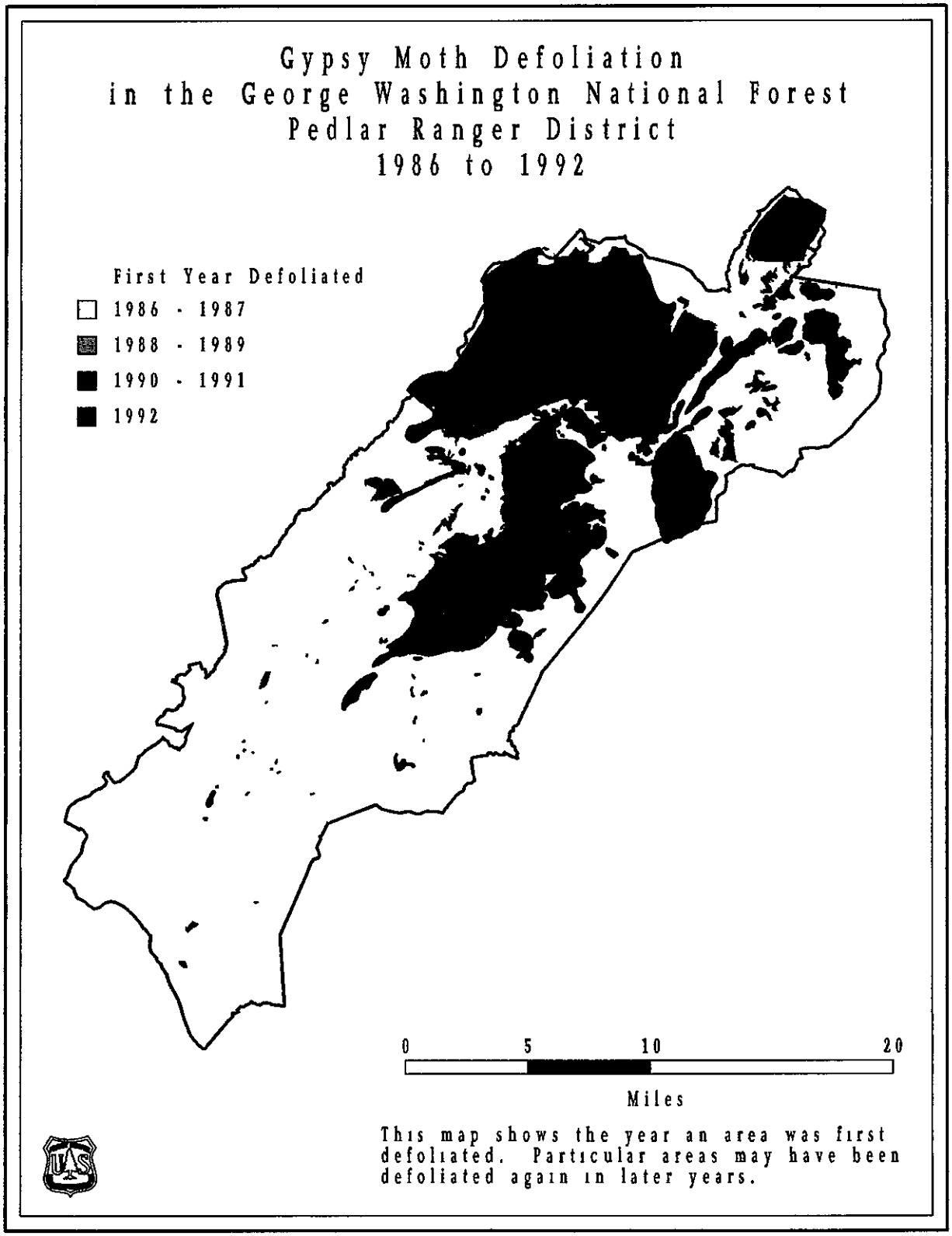
A new natural enemy of the gypsy moth is becoming established across the Forest as the result of its artificial introduction and its natural spread from the Northeast. This natural enemy is the insect pathogenic fungus, *Entomophaga maimaiga*. The fungus attacks and kills gypsy moth caterpillars across a broad range of population densities. It was artificially introduced into the Forest in 1991 and developed to epidemic levels in 1992, causing the widespread collapse of gypsy moth populations in some areas of the Forest The fungus is favored by wet springs, particularly if abundant rainfall occurs during the moths of May and June. E *maimaiga* will most likely alter the population dynamics and impacts of gypsy moth on the Forest.

Disease epidemics of gypsy moth, either NPV or *E. maimaiga*, are important natural control processes in the ecology of the insect These epidemics result in the release of millions of propagules, either virus particles or fungal spores, which contribute to the widespread collapse of gypsy moth populations across the forest landscape. These epidemics also result in the release of a vast number of propagules into the forest environment These propagules will cause disease in subsequent generations of gypsy moth and will initiate new disease epidemics in gypsy moth in the future.

Following this first outbreak of gypsy moth, the Forest will be subjected to future recurrent outbreaks as populations rise to defoliating levels and then collapse again Generally, the first outbreak is the worst in terms of duration and damage, subsequent outbreaks are usually of shorter duration and are less damaging generally. At this time, the first outbreak of gypsy moth is still spreading across the Forest, but on the very northern part of the Forest in 1992, gypsy moth populations increased to damaging levels again.

By summer 1992, reproducing populations of gypsy moth could be found on approximately 50 percent of the Forest. The map on the following page shows the location of the infestation through 1990 It is estimated that the entire Forest will be infested in the next five to seven years


Gypsy Moth Defoliation
in the George Washington National Forest
Lee and Dry River Ranger Districts
1986 to 1992
First Year Defoliated
1986 - 1987
1988 1989
1990 - 1991
1992
Lee RD
Dry River RD
0 5 10 20 30
Miles
This map shows the year an area was first defoliated. Particular areas may have been defoliated again in later years


Gypsy Moth Defoliation
in the George Washington National Forest
Pedlar Ranger District
1986 to 1992
First Year Defoliated
1986 - 1987
1988 - 1989
1990 - 1991
1992
0
5
10
20
Miles
This map shows the year an area was first defoliated. Particular areas may have been defoliated again in later years.

Approximately 40 percent of the Forest acreage has been defoliated since the outbreak began in 1986. The majority of this acreage is on the Lee, Dry River, and Pedlar ranger districts. Populations of gypsy moth have collapsed to low levels on approximately 25 percent of the Forest due to disease and starvation.

Table 3-10.
Defoliation and Tree Mortality by Gypsy Moths

Year	Acres Defoliated	Acres Damaged[1]
1986	1,870	–
1987	6,955	–
1988	17,975	–
1989	57,064	8,000
1990	125,815	8,000
1991	128,384	22,500 (approx)
1992	94,094	Information not available

[1]50 percent or more of trees killed following gypsy moth defoliation.

Beginning in 1989, following repeated years of gypsy moth defoliation, severe tree mortality became apparent in some forest stands. In 1989, approximately 8,000 acres of trees were killed on the Lee Ranger District. The largest area of complete mortality was 800 acres In 1990, an additional 8,000 acres of trees were killed following repeated defoliation. A severe drought in spring 1991 contributed to the dramatic increase in mortality reported for that year. The full extent of the damage caused by this first outbreak of the gypsy moth will not be apparent for at least 10 years; the amount of damage on the Forest will reflect the severity of defoliation by gypsy moth, the prevailing incidence of oak decline, and other predisposing factors, particularly the amount and timing of local rainfall.

There is concern about the effects of gypsy moth mortality on the oak component, and indirectly on many wildlife species. Repeated gypsy moth defoliation will severely damage the oaks in some stands and may reduce the density of oaks in other stands. Forest change is inevitable now that the gypsy moth is spreading throughout the Forest. The gypsy moth will initiate a long process of forest change and adaptation, where weakened trees die and are replaced by new vegetation. Trees surviving gypsy moth impacts will continue to grow and provide shade and resources for wildlife.

The gypsy moth is becoming a naturalized part of the hardwood forest ecosystem of the George Washington National Forest The Forest will change as a result of the gypsy moth. These changes will play out over several generations of trees. Forest change will be a long-term process. The Revised Plan recognizes the importance of ecosystem processes in the changing landscape of the hardwood forest following the appearance of the gypsy moth.

On areas of the Forest that receive heavy gypsy moth defoliation and subsequent mortality, dramatic composition shifts are anticipated The xeric (drier) sites now dominated by oak species will shift to more pine, red maple, black gum, and mixture of other nonsusceptible species. Mesic (moist) sites will continue to be occupied with yellow-poplar and mixtures of other nonsusceptible species with some oak component.

To date, research has indicated that few animal species are adversely affected by gypsy moth defoliation of forested stands. Where heavy mortality of oak results in wide-spread changes in tree species composition, such changes may affect the carrying capacity for certain species that rely on oak mast.

There are no data to support concerns that populations of gypsy moth that are under natural control on the George Washington National Forest will significantly impact vegetation on adjoining and other lands Populations on these lands increase and decrease relative to natural control and through pest suppression on those lands

The perception that gypsy moth does not significantly defoliate stands 1 - 15 years old is not accurate Often oaks in young stands are defoliated at rates similar to adjacent mature oak stands. However, healthy, vigorous trees are more likely to survive and recover from gypsy moth defoliation and resist secondary organisms

Effects of the Alternatives

The Chestnut Oak-Scarlet Oak Type-Group. This type-group is very susceptible to defoliation by gypsy moth due to the abundance of oak. Following the first outbreak, the gypsy moth increases to defoliating levels for intervals of approximately 1 year to 3 years and collapses and decreases to low levels for intervals of approximately 2 years to 4 years before increasing again.

Under **Alternative 3**, gypsy moth populations increase to defoliating levels and collapse to low levels naturally. Repeated years of defoliation in this forest type will lead to mortality of individual trees and stands of trees. Trees with poor crowns (e.g., severe oak decline symptoms and stands with a moderate to high incidence of oak decline) are most likely to die following an outbreak (Campbell and Sloan, 1977; Gansner and Herrick, 1984; Herrick

and Gansner, 1987). At this time, we cannot predict which stands will be damaged severely, although stands on poor sites are likely to be less severely damaged than stands on better sites (Houston and Valentine, 1977) Tree mortality will be present as a significant percent (perhaps 25 percent) of trees scattered through the stand and, in some instances, as large patches of dead trees.

Stands sustaining mortality following gypsy moth defoliation may change species composition over time (Campbell and Sloan, 1977) Species such as white pine, Virginia pine, and pitch pine may seed into sites where the oaks have been killed or red maple, black gum, and sassafras present in the understory may occupy the site. In other sites, laurel may become the dominant vegetation, slowing the development of a new stand of trees. Since these species are not favored species for the gypsy moth, these stands should not be as vulnerable to damage in subsequent years. Water yield decreases on the order of 10 percent when hardwood stands in watersheds are killed and subsequently regenerate to pine.

Under **all other alternatives**, stands of trees on land that is suitable for timber production may be considered for treatment with insecticides to manage gypsy moth populations The primary objective will be foliage protection of high value timber stands that contain gypsy moth populations that pose an immediate damage threat and in situations where timber harvesting operations must be deferred. Insecticide treatment to protect integrity of RNA's, special biological features, critical T&E habitat, foliage in recreation areas, and aesthetic values at specific viewing points will be considered on a case-by-case basis

Greater emphasis on management of gypsy moth on suitable land in the general forest area, as permitted under these alternatives, may delay the onset of the natural processes that regulate gypsy moth populations and may prolong each outbreak. Insecticide treatment delays the onset of regulatory factors, particularly NPV, which bring about the collapse of high populations of gypsy moth. Insecticide treatments may need to be repeated every few years as populations rebound from a previous treatment. Greater emphasis on managing gypsy moth populations may result in less tree mortality in treated stands.

White Oak-Black Oak Type-Group. The environmental effects of allowing gypsy moth to run its natural course -- as in **Alternative 3** -- are similar to those described for the chestnut oak-scarlet oak type-group.

Under **all other alternatives**, the environmental effects of increased gypsy moth management activities on suitable and unsuitable lands in the general

forest area are similar to those described for the chestnut oak-scarlet oak type-group.

Red Oak - Red Maple Type-Group. This group contains species of trees that are generally less favored by the gypsy moth, including sugar maple, yellow birch, black cherry, red maple, black locust, white pine, and hemlock. Stands where these species comprise 60 percent to 80 percent of the trees will generally be less susceptible to defoliation and damage, however, the oaks within these stands may be severely defoliated or damaged. Defoliation may alter the competitive status of these oaks and may lead to reductions in the oak component (Campbell and Sloan, 1977).

Under **Alternative 3**, no stands are protected from gypsy moth defoliation and damage. Some oaks may be defoliated and killed by gypsy moth. Under **all other alternatives**, stands of trees on land that is suitable for timber production may be considered for treatment with insecticides to manage gypsy moth populations The primary objective will be foliage protection of high value timber stands that contain gypsy moth populations that pose an immediate damage threat and in situations where timber harvesting operations must be deferred Insecticide treatment to protect integrity of RNA's, *special biological features, critical T&E habitat, foliage in recreation areas,* and aesthetic values at specific viewing points will be considered on a case-by-case basis.

Yellow Poplar-Mixed Hardwood Type-Group. This group contains species of trees not favored by gypsy moth, particularly yellow poplar. Under **Alternative 3**, stand-level defoliation may be less than in the predominantly oak types, however, defoliation on the oaks in the yellow poplar-mixed hardwood type may be severe (Campbell and Sloan, 1977). Openings created by the loss of red and white oak following repeated gypsy moth defoliation will probably be filled by yellow poplar, hemlock, and red maple

Under **all other alternatives**, stands of trees on land that is suitable for timber production may be considered for treatment with insecticides to manage gypsy moth populations. The primary objective will be foliage protection of high value timber stands that contain gypsy moth populations that pose an immediate damage threat and in situations where timber harvesting operations must be deferred. Insecticide treatment to protect integrity of RNA's, special biological features, critical T&E habitat, foliage in recreation areas, and aesthetic values at specific viewing points will be considered on a case-by-case basis.

Stands with Old Growth Characteristics. Old growth stands which are dominated by or have a high percentage of oak will be affected by gypsy moth, which will result in a decrease of oak. Oak will not be lost from the stand

but may lose dominance to more tolerant tree species such as ash, black gum, red maple, and pine Over time, stand structure and functioning should be maintained even with this possible shift in tree species dominance.

Once the gypsy moth has completed its early stages of development on favored host species, it is capable of feeding on and completing its development on hemlock. Observations of hemlock dominated forest types with old growth characteristics on the Dry River drainage suggest that these trees will sustain some defoliation during outbreak years, but do not suggest that widespread mortality will result.

Private Land. The gypsy moth causes impacts and changes to privately held forested lands in the same manner described above for public lands. Gypsy moth caterpillars may be carried on the wind from high elevation national forest lands to adjacent low elevation private lands when they disperse in spring Gypsy moth populations are not managed on high elevation, unsuitable lands under any alternative.

Under **Alternative 3**, gypsy moth populations would not be managed on national forest lands. Under this alternative, dispersal of caterpillars will be greatest. Also, under **Alternative 3**, dispersal of *E maimaiga* and NPV onto private lands will be greatest. Under **all other alternatives**, dispersal of early instar gypsy moth from some stands may be reduced due to gypsy moth suppression during the previous year on those lands suitable for timber production. Conversely, dispersal of *E maimaiga* and NPV will be somewhat reduced relative to **Alternative 3**, due to the gypsy moth management activities associated with the other alternatives.

Threatened, Endangered, and Sensitive Species (TES). To date, there is little evidence to suggest that the gypsy moth poses a direct threat to any threatened, endangered, or sensitive species, although few cases have been examined in sufficient detail. The gypsy moth may adversely affect species indirectly through loss of the canopy cover, the increased heating and drying of the litter layer, or through changes in soil moisture levels due to reduced transpiration during the periods when stands are defoliated. Micro-habitats may be altered on a short-term basis but should not pose a threat to TES species.

Under **Alternative 3**, gypsy moth populations are not managed in habitats of threatened, endangered, or sensitive species. Under **all other alternatives**, gypsy moth populations may be managed to prevent adverse impacts to threatened, endangered, or sensitive species, where necessary.

Special Interest Areas--Biological/Research Natural Areas. To date, there is no evidence to suggest that the gypsy moth poses a direct threat to the

integrity of special interest areas--biological or research natural areas. The gypsy moth may affect these areas indirectly through the loss of overstory trees, the loss of canopy cover resulting from defoliation in May and June, or through changes in soil moisture levels due to reduced transpiration during the period when stands are defoliated.

Under **all alternatives**, gypsy moth populations in Special Interest Areas--Biological are not managed unless TES species may be adversely affected by gypsy moth infestation. Under **all alternatives** except **Alternative 3**, gypsy moth populations may be managed in Research Natural Areas if the integrity of the area or ongoing research is threatened by defoliation and damage.

Developed and Dispersed Recreation. Studies indicate that the gypsy moth contributes to a number of adverse impacts on visitor use of developed recreation areas These impacts include the nuisance of caterpillars or their droppings, loss of shade, damage and death of trees, and an increased danger of injury or property damage due to the creation of hazards such as dead branches and trees (Goebl, 1987). Trees in recreation areas are under stress due to soil compaction and injury and may be more likely to die with the added stress of gypsy moth defoliation. Trees along trails and at trail-heads may be damaged or killed, creating hazards for hikers

Under **Alternative 3**, gypsy moth populations are not managed. Gypsy moth impacts may include all of the factors described above Under this alternative, long-term adverse impacts resulting from the loss of overstory trees will reduce the amount of recreation afforded at these developed sites Under this alternative, removal of hazard trees and branches is permitted Under **all other alternatives**, populations of gypsy moth are managed to reduce the adverse impacts of this insect. This will result in treatment with insecticides at irregular intervals. Removal of hazard trees and branches is permitted. Treatments do not occur along trails outside the recreation areas under any alternative.

Visual Quality. As a result of defoliation by gypsy moth, the number of dead standing trees visible to the public will increase. In some areas, large expanses of trees may be dead. Treatment of gypsy moth populations to protect aesthetic values may be considered on a case-by-case basis under **all alternatives** except **Alternative 3.**

Table 3-11.
By Alternative, Thousands of Acres That May Be Considered for Insecticide Treatment[1]

Alternative	Generally Available	Available Under Limited Circumstances	Not Available
2	898	163	0
3	0	0	1,061
4	935	126	0
5	926	135	0
6	435	545	81
7	973	88	0
8	596	465	0
8A	668	393	0
9	175	779	107
10	647	414	0
11	521	540	0
12	927	134	0
13	188	766	107
14	685	376	0

[1]These figures represent the maximum number of acres which could be considered for insecticide treatment. The actual number of acres to be treated must be determined by a site-specific environmental analysis

Wildlife/Invertebrates. Few data suggest that gypsy moth defoliation adversely impacts invertebrate species. However, regenerated or released vegetation growing in killed patches of trees may provide food resources for certain species of invertebrates that are not commonly found in mature forests (Schowalter et al , 1981).

Under **Alternative 3**, insecticides are not used to manage gypsy moth populations. Changes in invertebrate populations may result from interactions between gypsy moth and these species. Under **all other alternatives**, insecticides may be used to manage gypsy moth populations. Treatment of stands with insecticides may significantly reduce or cause the local disappearance of native Lepidoptera (moths and butterflies) and perhaps other leaf-chewing arthropods (arthropods include insects and other animals with jointed limbs and a hard outer body wall or cuticle made of chitin) in the canopy and on the forest understory vegetation. Treatments with diflubenzuron along streams may cause a reduction in aquatic arthropods, particularly when treated leaves drop

into the streams each fall. Populations of some insect predators and parasites may drop to low levels in treated forest stands due to the reduction in the quantity of their prey or hosts.

Wildlife/Fish. Under **Alternative 3**, fish may benefit from the increased food supply provided when numerous small gypsy moth caterpillars drop into streams and lakes. Wildlife/fish also benefit from the increased coarse wood debris that falls to the forest floor and from the creation of snags. Loss of shade during peak defoliation may contribute slightly to the warming of water. Conversely, stream flow from watersheds increases following severe defoliation relative to undefoliated watersheds. This increase in stream flow may benefit fish. Long-term changes in vegetation, particularly changes from hardwoods to pines, may contribute to an overall decline in average water yield of affected stands (White and Schneeberger, 1981). Fish may benefit by the introduction of coarse woody debris in the stream channel as limbs and trees killed following gypsy moth defoliation fall to the forest floor.

Gypsy moth defoliation may indirectly contribute to the rate of acidification of acid-sensitive streams in a very modest way. Elevated levels of nitrate are introduced into streams during gypsy moth defoliation through the introduction of insect droppings, leaf pieces, and through runoff or sub-surface flow; the introduction of nitrate contributes to the acidification of stream water.

Under **all other alternatives**, gypsy moth populations may be managed to reduce adverse impacts to trout streams; however, the application of diflubenzuron to manage gypsy moth populations may cause adverse impacts on the aquatic arthropods inhabiting streams. This occurs when treated foliage falls or is swept into the streams and is consumed by aquatic arthropods. Reductions in populations of aquatic arthropods may result in fewer food items for fish.

Wildlife/Amphibians and Reptiles. Relative to **Alternative 3**, there is no information to suggest that gypsy moth defoliation and tree mortality impacts amphibians and reptiles directly. Under this alternative, indirect effects such as loss of shade and drying of the forest floor may pose a serious threat to the Cow Knob salamander and other salamanders.

Under **all other alternatives**, gypsy moth populations may be managed to prevent defoliation and damage; insecticides may be used to protect TES habitat such as that of the Cow Knob salamander.

Wildlife/Birds. There is no information to suggest that gypsy moth defoliation and tree mortality adversely impacts birds directly. Under **Alternative 3**, indirect effects such as loss of shade may contribute to nesting failure by exposing broods to predators. A prolonged loss of hard mast may adversely influence turkey populations, however, observations suggest that turkey populations generally remain stable or increase slightly. Shifts may occur from forest interior species to species favoring edge (Cooper et al., 1987). Tree mortality leads to increased growth of understory vegetation favored by grouse. An increase in the number of dead snags provides more wood boring insects for foraging birds and provides additional opportunities for cavity nesting birds.

Under **all other alternatives**, application of insecticides is considered in order to reduce the impacts of defoliation and damage on birds. Under these alternatives, canopy insects and other arthropods may be reduced in number following treatment with insecticides. Birds nesting and foraging in treated areas may spend more time seeking food and less time caring for brood at the nest.

Wildlife/Mammals. There is no information to suggest that gypsy moth defoliation and tree mortality under **Alternative 3** impacts mammals directly. Under this alternative, indirect effects such as loss of shade and loss of hard mast production may influence population density of species dependent on these factors; such as squirrels. However, very little is known about the impact of these indirect effects on mammals. During gypsy moth defoliation, hard mast production may be reduced or eliminated over wide expanses of forested lands Hard mast failure may extend for four years or more (Gottschalk, 1986). Conversely, tree mortality will lead to the increased growth of understory vegetation and soft mast.

Under **all other alternatives**, gypsy moth populations may be managed to prevent the adverse impacts of defoliation on shade and hard mast production. Under these alternatives, small mammals that feed on caterpillars and pupae may find fewer of these items in stands treated with insecticides.

Southern Pine Beetle

The impact of the southern pine beetle on forests is documented in the 1987 *Final EIS for the Suppression of the Southern Pine Beetle - Southern Region*. On the Forest, the impact has been minor. The hard pines, particularly loblolly, shortleaf, and Virginia, have been killed by the southern pine beetle. The southern pine beetle has been reported infesting white pine and often attacking thinned stands where annosum

root rot has impaired stand health. However, the insect rarely attacks healthy white pines.

Under **Alternative 3**, southern pine beetle populations would fluctuate naturally. Small patches of pine -- usually growing on poor, dry sites -- will be killed These sites may slowly change to hardwoods, particularly chestnut oak and scarlet oak, or may remain in pine if a seed source remains and fire burns through the area Wildlife dependent on pines and the pine community may diminish or be replaced as pines are replaced by oaks.

Under **all other alternatives**, southern pine beetle populations may be managed. Infested stands may be salvaged or treated to prevent further mortality. Insecticide use may be considered for treatment of infested trees. Because areas of infestation are small and isolated, the extent of treatment is limited. Wildlife dependent on pines and the pine community may diminish in isolated stands which are replaced by oak.

Oak Decline

Oak decline results from the interactions of physiologically mature trees, predisposing stress, and disease and insect pests of secondary action (Wargo et al , 1983). It causes reduced growth, crown dieback and, after several years, mortality in susceptible trees. Members of the red oak group (northern red, black, and scarlet oaks) are more susceptible than those in the white oak group (white and chestnut) (Starkey et al , 1989). Prior to widespread gypsy moth defoliation, the main predisposing stress was prolonged drought Severe drought and repeated years of defoliation increase stress on oak trees and accelerate the onset of mortality. Damage may occur on all sites, but is more common in stands growing on average and poor sites. The effects of this damage include reduced hard mast production and short-term and long-term changes in tree species composition. Oak decline in forest stands contributes to many ecosystem processes, including nutrient cycling, stand dynamics, and forest succession The dying and dead trees provide wood boring insects for foraging birds and provide additional opportunities for cavity nesting birds. This tree mortality leads to increased growth of understory vegetation which may provide additional sources of soft mast for wildlife

The impact of oak decline on the Forest is already substantial In 1986, the national forests had the highest incidence of oak decline among all forest ownerships in Virginia (24 percent), with the most dense concentrations occurring in the northern mountains (Oak et al , 1990) The distribution and severity are illustrated by the Lee Ranger District where 56 percent of the acres were affected (Oak et al., 1990). The acreage killed in association with gypsy moth defoliation cited earlier in this

section reflects the combined effects of pre-existing oak decline and defoliation

Under **Alternative 3**, stands with oak decline are not managed Patches of dead trees will become more apparent over time The size of these patches will depend on the extent to which groups of susceptible oaks share common site characteristics and stress environments Some large areas of mortality are expected in the future. These areas may change in composition of overstory tree species as they regenerate, particularly if other species are already present in the affected areas Species such as white pine, Virginia pine, and pitch pine may seed into sites where the oaks have been killed, or understory vegetation such as red maple, black gum, and sassafras may occupy the site. In other areas, laurel may become the dominant vegetation, slowing the development of a new stand of trees.

Oak decline will reduce the abundance and diversity of oaks, while pines and other hardwoods are expected to increase The age structure and species composition of stands may change due to the death and break-up of stands affected by oak decline; this may result in the development of thriftier, more diverse and complex stands that are less susceptible to oak decline The interaction of gypsy moth and oak decline will accelerate this process on typical oak decline sites and may decrease the prevalence of oak (Houston, 1981).

Under **all other alternatives**, some stands with oak decline may be managed through regeneration harvest The harvest of oak decline stands under these alternatives may lead to thriftier stands and a more complex age structure and species composition of the Forest

Impact in Recreation Areas

Trees in recreation areas sustain considerable stress due to soil compaction, root damage, and stem injuries. Wounds and damage may lead to internal decay that weakens the roots, branches, or stems of injured trees. These weakened and defective trees pose a safety hazard to visitors.

Removal of hazard trees and limbs in recreation areas for protection of the public is permitted under **all alternatives.** The occurrence of hazard trees in these stands will continue as they age

LAND USE

Ownership

The boundary of the Forest encompasses 1.8 million acres, but only 1.1 million of those acres are national forest land. National forest land is interspersed with land that remains in private ownership.

As of October 1992, the Forest property boundaries totaled nearly 3,000 miles. In an ongoing effort, half of these boundaries have been marked and can be readily identified by the general public.

About 300,000 acres located near the center of the Forest form a relatively consolidated block of national forest land. The block contains less than a dozen small private holdings.

At least six additional areas have contiguous national forest land in blocks of 10,000 acres or more. The intermingled ownership pattern causes some Forest tracts to be inaccessible to the public and difficult to manage.

Effects of the Alternatives

All alternatives have similar land adjustment programs aimed at consolidating national forest ownership Lands are to be added through either acquisition or exchange. A map that identifies lands being considered for acquisition or exchange is available in the Forest Supervisor's Office, Harrisonburg, Virginia, and at each ranger district office. Lands activities, including ownership adjustment strategies, are further described in Appendix H of the Revised Forest Plan.

Alternative 3 has the most ambitious program for land acquisition in that it provides for the acquisition of buffer lands along a wilderness-corridor system.

Special Uses

As of September 30, 1990, approximately 7,600 acres of the Forest were under Special Use authorizations to individuals, corporations, and other government agencies. The predominant use is for public roads and utility rights-of-way. Water impoundments for flood control and public water supplies are the next major category of use. Agricultural uses -- primarily for grazing -- are the fifth major-use category.

There are three camps on the Forest under Special Use authorization to private organizations for educational purposes: Camp May Flather, Nature Camp and Powell's Fort.

Special Use authorizations for personal use are a minor land commitment. Less than 50 acres are devoted to private uses (excluding electronic uses) such as wells, springs, private road easements, cemeteries, etc. There are no authorizations for private vacation homes on the Forest.

Effects of the Alternatives

All alternatives except **Alternative 3** allow for special uses provided the uses are consistent with the objectives of management of the area in question. Prior to authorization, every request for use is assessed to determine compatibility and compliance. **Alternative 3** eliminates some existing authorizations and grants no new authorizations.

Utility Corridors

Utility corridors are the major use of rights-of-way and are primarily electricity transmission lines in excess of 66 kilovolts and natural gas transmission lines. Also included in this category is the Virginia Power Bath County Pumped Storage Project.

Facilities in utility corridors are currently authorized either by Special Use authorization or license. When compatible, new uses are accommodated by widening existing corridors.

Effects of the Alternatives

All alternatives manage utility corridors. However, no new uses are granted under **Alternative 3**. Management Area 20 in the Revised Forest Plan contains the standards for these areas. Specific management goals for each utility corridor are found in a *Right-of-Way Management Plan* on file in each district office.

Communications Sites

Deerfield Ranger District:

Elliott Knob (6 acres) - This is the most heavily used facility since its location allows a wide service area. Elliott Knob serves educational television, TV translators, FM radio, commercial two-way radio systems, amateur radio, state and local government, and a Forest Service repeater. The site is highly visible and is located under the crest of the mountain to provide protection to the Radio Quiet Zone. Topography limits the area available for development, but through consolidation of existing uses and maximum utilization of structures, the site will continue to accommodate future applicants.

Dry River Ranger District:

White Grass Knob (3.9 acres) - A TV translator serving the immediate vicinity is located here. Expansion of the site is not expected due to Radio Quiet Zone restrictions

Reddish Knob (1.5 acres) - This site provides primary communications for the Sugar Grove Naval Facilities. Only uses that can be controlled through the Radio Quiet Zone are anticipated here. Commercial facilities are prohibited.

Narrowback Mountain (5 5 acres) - This site is currently occupied by a commercial FM radio station and allows compatible uses upon request Narrowback is an intermediate mountain and consequently, fairly restrictive as to area coverage

James River Ranger District:

North Mountain (1.3 acres) - Located on a major ridge, this site is currently used by industrial microwave and state government two-way radio. Demand for this site is very low.

Lee Ranger District:

Big Mountain (20 acres) - Big Mountain accommodates commercial as well as educational television stations, two-way radio communications by commercial and private users, ham radio operations and governmental users such as rescue squads, county government, state and federal agencies. This site can accommodate other applicants since space is not a limiting factor and the site is in the periphery of the Radio Quiet Zone. Most of the site is effectively screened from I-81, which is the main viewing area.

Signal Knob (1 acre) - This site is used for educational television Since it is in a historical area, expansion of the site is prohibited. Additional users can be accommodated within the existing site.

Great North Mountain (3 acres) - Located on the Virginia-West Virginia line, this site is used by industrial microwave, FM radio, and TV translator. Radio Quiet Zone limitations affect this site.

North Mountain (2.3 acres) - Commercial and industrial microwaves are the primary uses of this site. The Forest Service has a radio repeater at this location. A large commercial microwave facility is located nearby on private land.

Pedlar Ranger District:

Rocky Mountain (10 acres) - Located on the Blue Ridge, this site supports a variety of uses. Governmental facilities -- such as the Federal Aviation Administration, National Park Service, and the Forest Service -- share the site with industrial microwave, commercial television, commercial two-way radio and amateur radio Expansion is possible. There are no specific restrictions on this site, providing that new uses are compatible with existing facilities

Warm Springs Ranger District:

Duncan Knob (1 acre) - Used by state government only. Allowable uses are severely restricted by the close proximity with Green Bank National Radio Astronomy Observatory. Further development of this facility is unlikely.

Effects of the Alternatives

Alternative 3 restricts all future use to the current sites. In **all other alternatives,** new site requests are not granted as long as space is available on existing sites Requests for new sites are subject to environmental analysis and approval by the Regional Forester.

MINERALS

The Forest has approximately 861,000 acres of Federally-owned minerals, excluding acres devoted to wilderness. All are available for various mineral development activities The Federal mineral estate is under acquired lands status and as such, is subject to Federal leasing laws and regulations. No public domain land, which allows for staking of mining claims and patenting of mining claims, is within the Forest.

Mineral rights are privately-owned on approximately 200,000 acres or 19 percent of the Forest. Of this total, 72 percent are mineral rights outstanding to third parties and 28 percent are mineral rights that were reserved by the grantor at the time of acquisition by the U S. Government. Areas of reserved and outstanding rights are scattered throughout the Forest and are displayed on the Forest status atlas. An atlas is available at each ranger district and in the Supervisor's Office.

The most recent mining operation on the Forest that involved private mineral rights was the Amlite mine on the Pedlar District. The Amlite Corporation produced and milled lightweight aggregate from slate excavated from an open-pit quarry The plant operated under rights granted to the outstanding mineral estate Since 1974, economic conditions have curtailed operations and the plant is currently being dismantled and the site reclaimed.

Leasable Energy Minerals

The Forest lies in what is known geologically as the Eastern Overthrust Belt. Natural gas and oil potential is speculative for this mostly unexplored region. In the late 1970s and early 1980s, the Forest attracted significant attention following scientific reports of possible gas and oil reserves. At its peak activity in 1982, roughly 725,000 acres were leased on the Forest. Since then, interest in leasing of Forest lands has greatly declined

Currently, about 62,000 acres of the Forest are leased on 31 oil and gas leases, but no drilling is being done. The majority of the leases are on the western portion of the Warm Springs Ranger District. There have been past successful drilling attempts for natural gas from two known producing areas on the Forest. These are the Bergton-Crab Run Anticline on the Dry River District in northern Rockingham County, Virginia, and the Thornwood-Horton Field in Highland County, Virginia and Pendleton and Pocahontas counties, West Virginia.

The decline in leasing is due to several factors: a lowering of oil and gas prices in the mid to late 1980s, discouraging results from early drilling attempts, and a re-evaluation of the potential of the overthrust belt.

Exploration for leasable energy minerals -- natural gas and oil -- fluctuates with economic and technological conditions. As supplies are depleted in other parts of the country and prices rise, attention may again be focused on the Eastern Overthrust Belt which includes the Forest. Areas of the Forest with high potential for gas could be considered for mineral exploration.

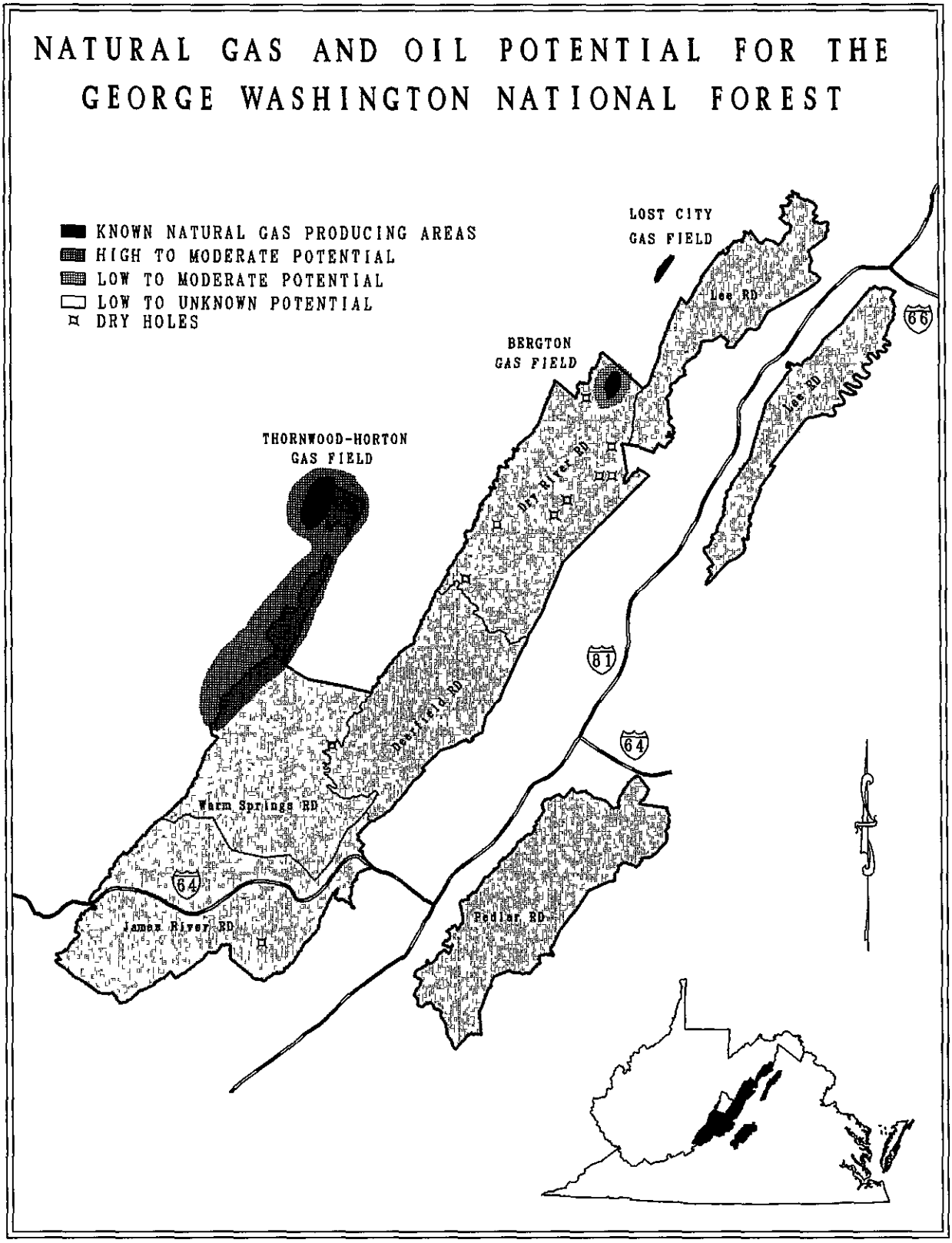
The map on page 3-63 shows the potential of the Forest for gas and oil production. Areas are classified as either high, medium, low, or unknown potential.

High Potential. geologic environments that are highly favorable for the occurrence of undiscovered oil and/or gas resources. Includes areas previously classified as Known Geologic Structures (KGS). The area is on or near a producing trend and evidence exists that the geologic controls of reservoir, source, and trap necessary for the accumulation of oil and/or gas are present.

Moderate Potential. indicates the geologic environment is favorable for the occurrence of undiscovered oil and/or gas resources; however, one of the geologic controls necessary for the accumulation of oil and/or gas may be absent.

Low Potential: the geologic, geochemical, and geophysical characteristics do not indicate a favorable environment for the accumulation of oil and/or gas resources. Evidence exists that one or more of the geologic controls necessary for the accumulation of oil and/or gas is absent.

Unknown Potential: a region where the geologic information is insufficient to otherwise categorize potential.


NATURAL GAS AND OIL POTENTIAL FOR THE GEORGE WASHINGTON NATIONAL FOREST
KNOWN NATURAL GAS PRODUCING AREAS
HIGH TO MODERATE POTENTIAL
LOW TO MODERATE POTENTIAL
LOW TO UNKNOWN POTENTIAL
DRY HOLES
LOST CITY GAS FIELD
BERGTON GAS FIELD
THORNWOOD-HORTON GAS FIELD
Lee RD
Lee RD
Dry River RD
Deerfield RD
Warm Springs RD
James River RD
Pedlar RD
66
81
64
64

The majority of the Forest is unexplored for oil and gas resources. Only a few wildcat wells have been drilled. Vibroseis and shot-hole seismic surveys have been completed but their results are not public information What little information is available on sub-surface conditions is held in confidence by the energy companies doing the work

The six ranger districts on the George Washington National Forest are listed below with a brief outline of their exploration and development potential for gas and oil.

Deerfield Ranger District. The Deerfield has had no industry interest for gas and oil besides leasing in the 1970s and early 1980s. This district is rated as low-to-unknown potential. One dry hole was drilled north of Millboro Springs on private land Geologic data is lacking for much of the area, giving it an unknown potential rating Several dry holes drilled to the northeast on the Dry River RD indicate that potential along this trend of geologic structures is low.

Dry River Ranger District. Four dry holes were drilled in the 1970s and early 1980s on the Dry River RD southwest of the Bergton gas field and along the same general geologic structure. Two additional dry wells were drilled on private land within district boundaries The Bergton gas field is not presently being developed due to poor results from existing wells. The area surrounding the Bergton field has low to moderate potential for development. The rest of the district has low to unknown potential.

James River Ranger District. The James River has unknown to moderately low potential for natural gas. The eastern side of the district has the lower potential Two holes on private land are all that's been attempted. A dry well at Eagle Rock, Va., was abandoned and plugged in the 1970s. A wildcat well attempted at Paint Bank, Va., in 1985 was abandoned prior to completion due to environmental problems. Paint Bank, Va , is roughly five miles southwest of the boundary for the James River RD The higher potential on the district is along the West Virginia line (along the Alleghany Front), but no drilling information is available. The Alleghany Front lies along the same trend of rocks but to the southwest of the Thornwood-Horton gas field.

Lee Ranger District. The Lee has unknown to moderately low potential for natural gas The portion of the district in West Virginia near the Lost City gas field has the highest potential. The Lost City field produced gas until 1973 and is presently used as a gas storage area A well was drilled by Amoco in 1981 just to the north along a trend in Frederick County, outside the Forest.

Pedlar Ranger District. Industry has shown little or no interest in this area. The potential for commercial development of oil or gas on the Pedlar RD is rated as low The drilling of an exploration well in this area would be highly risky. Geologic conditions suggest it has the least potential of any of the districts simply due to the fact that it is in the Blue Ridge and not within the Valley and Ridge Physiographic Province.

Warm Springs Ranger District. The Warm Springs district has moderately high potential in the Laurel Fork Roadless Area. The Thornwood-Horton gas field covers part of this area Nearby shut-in producer wells in West Virginia are awaiting a gas pipeline to enable them to produce Higher natural gas prices could spur industry to build a pipeline and develop more wells in the region. The Thornwood-Horton field has potential for both natural gas production and later, for use as a natural gas storage area during the low-demand summer months Recently, three seismic survey permits were issued for lines across the West Virginia-Virginia state line southwest of this area Areas along this trend (Alleghany Front) have the highest potential on the Forest Other areas on the district, to the east, have low-to-unknown potential.

Other Federally-owned leasable resources on the Forest include geothermal energy Federal lands around the Warm Springs area in Bath and Alleghany counties were once leased for geothermal exploration by Amax Exploration, Incorporated. These leases have been relinquished by the company. Several shallow exploratory wells were drilled on private lands to test the geothermal gradient Drilling results indicated relatively low temperatures at depth As a result, these geothermal resources will probably not be developed for any industrial or commercial use.

Minor amounts of semi-anthracite coal occur sporadically in portions of the Valley and Ridge Province in the Forest Their economic potential is very low.

Leasable Non-Energy Minerals

Past historic activities on the Forest include mining for iron, manganese, copper, tin, lead, and zinc. Iron and manganese were by far the most important of these metallic minerals. Numerous abandoned mines, exploration sites, and furnaces are located throughout the Forest Iron and manganese mining and production were active mostly during the 1800s to the early 1900s. Most of the easily accessible, high-grade deposits of metallic minerals have been depleted. However, significant quantities of low-grade deposits of metallic minerals still exist. Iron mining was centered on parts of the James River Ranger District and on the Lee Ranger District. Manganese mining was concentrated on the Pedlar Ranger District and on the Lee Ranger District. The ores were commonly formed in the near-surface zone of rocks through weathering processes

A small kaolin deposit on the western edge of the Pedlar District could generate some future development activity. Kaolin deposits on private land adjacent to the Pedlar District have recently been utilized by a local limestone quarry operator. Other mineral resources which underlie the Forest include: high-calcium limestone, slate suitable for lightweight aggregate, ceramic-grade shale, and high-silica sandstone.

Leasable non-energy minerals -- iron, manganese, copper, tin, lead, zinc -- are expected to elicit only limited interest from industry. Demands for Forest minerals are expected to remain about the same since private lands supply most of the mineral needs of the local communities and industry. However, new product uses and local market conditions can alter this pattern

Currently, no prospecting permits or hardrock leases for non-energy leasables are issued or have been applied for. The Forest contains small deposits of manganese and tin, which are strategic or critical minerals The potential for significant deposits of other strategic or critical metals is considered low at this time. However, economics and market conditions constantly change, as does new technology. Additional exploration work can, and often does, find new deposits in areas thought to have none.

Saleable Common Variety Minerals

The Forest has vast reserves of common variety minerals useful as construction and industrial materials which are expected to continue to serve Forest and local needs. These include varieties of sandstone, granite, shale, limestone, basalt, and other common variety rocks. Presently the Forest issues about 20 to 30 permits per year, mostly for free use of small quantities of shale and surface rock for home use

Saleable common variety minerals will continue to be used by the Forest and the public. Demand is expected to stay the same or increase slightly as local populations increase.

Federally-owned shale deposits on the Pedlar District were explored by deep auger drilling in 1987 by General Shale Products Corporation. These deposits are adjacent to General Shale's operations on private land A proposal to open a shale pit is possible sometime in the future. Sand and gravel resources occur in some thick alluvial terraces in the Forest. An example of this resource potential is along the South River-St. Mary's River flood plain on the Pedlar Ranger District.

The Commonwealth of Virginia is currently conducting an inventory of limestone resources in the western part of Virginia which includes the Forest. Limestone is used to remove sulphur dioxide from the smokestacks of coal burning power plants. With the passage of the Clean Air Act, the kind of high quality limestone suitable for desulfurization of smokestack gases is in great demand. The Forest may contain limestone deposits valuable for this use

Limestone is also processed to make quicklime which has extensive uses in water treatment, sewage treatment and hazardous waste treatment. The Forest has potential for limestone suitable for these uses.

Table 3-12
Thousands of Acres Available for Leasable Energy (Oil and Gas) Minerals[1]

Alternatives	Leasing with Standard Lease Terms	Leasing with Stipulations	Leasing with No Surface Occupancy	Unavailable due to Congressional Action[2]	Unavailable due to Administrative Action
2	338	644	47	32	0
3	0	0	0	32	1,029
4	933	70	26	32	0
5	916	84	29	32	0
6	33	943	53	32	0
7	194	794	41	32	0
8	223	768	38	32	0
8A	145	842	42	32	0
9	51	918	60	32	0
10	396	591	42	32	0
11	12	964	53	32	0
12	397	600	41	32	0
13	6	982	53	32	0
14	298	691	40	32	0

[1]The above acreage figures do not distinguish between Federal and private mineral rights Approximately 19 percent of the Forest contains private mineral holdings
[2]Additional lands would be added to this classification if roadless areas recommended for wilderness study in Alternatives 3, 6, 8, 8A, 9, 10, 11, 13 and 14 were designated as wilderness through legislation

Table 3-13.
Thousands of Acres Available for Non-Energy Leasable Minerals by Alternative[1]

Alternatives	Leasing Generally Available	Leasing on Case by Case Basis	Unavailable due to Congressional Action[2]	Unavailable due to Administrative Action
2	698	300	32	21
3	0	0	32	1,029
4	942	68	32	19
5	924	84	32	21
6	342	648	32	20
7	764	245	32	20
8	529	482	32	18
8A	479	532	32	18
9	189	825	32	15
10	710	298	32	21
11	312	700	32	17
12	802	206	32	21
13	190	824	32	15
14	535	475	32	19

[1]The above acreage figures do not distinguish between Federal and private mineral rights Approximately 19 percent of the Forest contains private mineral holdings
[2]Additional lands would be added to this classification if roadless areas recommended for wilderness study in Alternatives 3, 6, 8, 8A, 9, 10, 11, 13 and 14 were designated as wilderness through legislation

Table 3-14
Thousands of Acres Available for Salable Minerals by Alternative[1]

Alternatives	Mineral Material Sales Allowed	Mineral Material Sales on Case by Case Basis	Unavailable due to Congressional Action[2]	Unavailable due to Administrative Action
2	330	670	32	29
3	0	0	32	1,029
4	924	76	32	29
5	907	93	32	29
6	26	894	32	109
7	185	824	32	20
8	214	786	32	29
8A	141	858	32	30
9	47	707	32	275
10	387	971	32	42
11	4	891	32	134
12	379	621	32	29
13	0	802	32	227
14	283	716	32	30

[1]The above acreage figures do not distinguish between Federal and private mineral rights Approximately 19 percent of the Forest contains private mineral holdings
[2]Additional lands would be added to this classification if roadless areas recommended for wilderness study in Alternatives 3, 6, 8, 8A, 9, 10, 11, 13 and 14 were designated as wilderness through legislation

General Effects of the Alternatives

Existing oil and gas leases, permits, or other approved mineral activity plans on the Forest do not vary by alternative. Tables 3-12, 3-13, and 3-14 display how the Forest is allocated, by alternative, for minerals. Once the existing leases and permits expire, terminate, or cancel, new leases follow the established Revised Forest Plan allocations.

The acres available for minerals are the acres where people may prospect, and occasionally, might discover and develop a mineral deposit Acres available for minerals are not the acres which will be mined. On the contrary, mineral deposits suitable for mining are scarce. Less than 1 percent of the acres available for minerals can ever be expected to be mined. Over the past 10 years less than 300 acres were mined on the Forest. Most of the mined acreage was from development of private mineral rights. In 1985, on Federal minerals, mining took place in several pits (about 25 acres in total) used by the State for emergency repairs for Hurricane Juan.

Exploration for minerals requires that large areas be searched because mineral deposits suitable for development are scarce. Areas suitable for mineral extraction are relatively small and isolated features on the vast acreage of the Forest Most of the searching of these large areas does not disturb the ground surface It is done by (1) analysis of satellite images, remote sensing images, aerial photos, and (2) by geologic mapping, and (3) study of existing data from previous exploration or mining.

If an area looks promising, some additional exploration made be performed, such as, (1) taking small rock specimens, (2) conducting geochemical sampling, and (3) conducting geophysical surveys. These activities involve minor amounts of ground disturbance Most searches are abandoned at this point as not promising.

If, however, a site shows promise, then detailed exploration may be used. Existing roads are used to provide access whenever possible In a few cases, road construction or reconstruction may be needed. Vegetative clearing and ground excavation would be needed for exploration activities such as drilling, trenching and bulk sampling. Water, generally from a surface source, may be used. Ground disturbance for an exploration site generally is an area about 1/10 to 1 acre in size Exploration activity is sporadic, and usually lasts for a few weeks or months. If this work does not show a discovery, the roads and excavations are reclaimed. Most of the time this is the case, because very few exploration efforts make a discovery that leads to mining.

If a discovery is made, then the mineral may be extracted. Developments, such as a mine or a gas field, would require roads, site clearing, excavation, water development, transmission corridors, and associated facilities. Based on the types of mineral deposits that may be developed on this Forest, ground disturb-

ance for a development site may vary from a few acres or less for a small mine, to a few hundred acres for a large mine. The mineral extraction usually may last for several years to a few decades. Under the Federal leasing laws and regulations, the Forest exercises extensive control over the mineral extraction, whether for natural gas or a hardrock mineral. Environmental effects are carefully considered and mitigating measures are designed to protect the environment. Development takes place within the framework of the management area in which it is located When the mining is completed, the area is reclaimed. See Appendix E for additional discussion of mineral exploration and development activities.

The potential of the Forest for mineral activity is generally low. Natural gas reserves in certain areas have some development potential. But the majority of the Forest has a low potential for natural gas development. Other non-energy and common variety mineral development potential is also generally low on the Forest. Due to the diverse nature of these kinds of mining activities, a site specific environmental analysis at the time a lease, permit, or operating plan is requested would be required to describe any potential effects to the environment. The different alternatives vary in the amount of acreage available for leasing and development of government-owned minerals.

Exploration and development of natural gas, other leasable minerals and common variety minerals would have some effects on the environment. Potentially adverse effects could be expected to the following resources without mitigation measures; visuals, recreation, watershed, cultural resources, wildlife, and fisheries. The use of stipulations in appropriate areas and mitigating measures during the review of an operating plan can significantly decrease adverse impacts to these other resources. Adverse effects to research natural areas, threatened, endangered, and sensitive species, wildernesses, and wild/scenic rivers are very remote because mineral activities in these areas are either prohibited or very restricted due to existing laws, regulations, and lease stipulations.

Surface disturbance resulting from roads, pad construction and other excavations can impact soil, vegetation, cultural and water resources. At drillsites and mine sites, topsoil is stripped and stockpiled for later use in site rehabilitation, but the associated vegetation and vegetative site productivity is lost until then. Some erosion of the exposed surface and sedimentation of streams may result. Wildlife may be temporarily displaced to some extent by the noise and activity at the well location Wildlife may be displaced for many years in areas used for active mining Air quality reduction from dust will occur locally along unsurfaced roads. Dust and other emissions from mining and gas fields may reduce air quality. If the well is drilled in a previously undeveloped area, this may change the opportunity for dispersed non-motorized recreation to motorized if the new road is left open to the public.

The economic effects of mineral development would be benefits to the local economy in terms of jobs and purchase of goods and services. Other economic benefits include oil and gas royalty and rental income to the U S. Treasury and to counties affected. If extracted, the minerals would constitute an irreversible, irretrievable commitment of the resource.

In Virginia and West Virginia, many people are concerned about possible environmental effects from proposed mines. People usually do not want mining in their "backyard", in their neighborhoods, near their communities or in their County. This concern leads to opposition to proposed mining on private lands, and the request that the project go someplace else, as far from people as possible, in order to avoid potential environmental impacts.

In Virginia and West Virginia, there are no more remote and less populated areas than the National Forest System lands. In terms of keeping adverse impacts from mineral activities as far away from as many people as possible, the National Forest is the last and best opportunity. Those alternatives which prohibit mining on the Forest will shift the impacts to private land closer to where people live. More environmental laws and regulations are applied to mining on Federal land than on private land.

Effects to mineral resources are primarily measured by the management objectives and restrictions from other Forest resources that decrease the availability of the mineral resource base. Public desire to access mineral resources is dependent on this as well as the mineral potential and market conditions for the minerals.

Specific Effects of the Alternatives

Federally-owned minerals are unavailable under **Alternative 3**. The only minerals activity is on reserved/outstanding mineral rights that are privately owned. Some mineral exploration and development may occur on private minerals in the next 10 years to 15 years.

Because activity on Federal minerals is prohibited under **Alternative 3**, there are no potentially adverse effects to the surface environment; there is no energy resource development; no revenues are collected for mineral commodities.

Alternative 3 requires modification of Bureau of Land Management and Forest Service policies and regulations on mineral availability in addition to congressional oversight hearings and a formal withdrawal process.

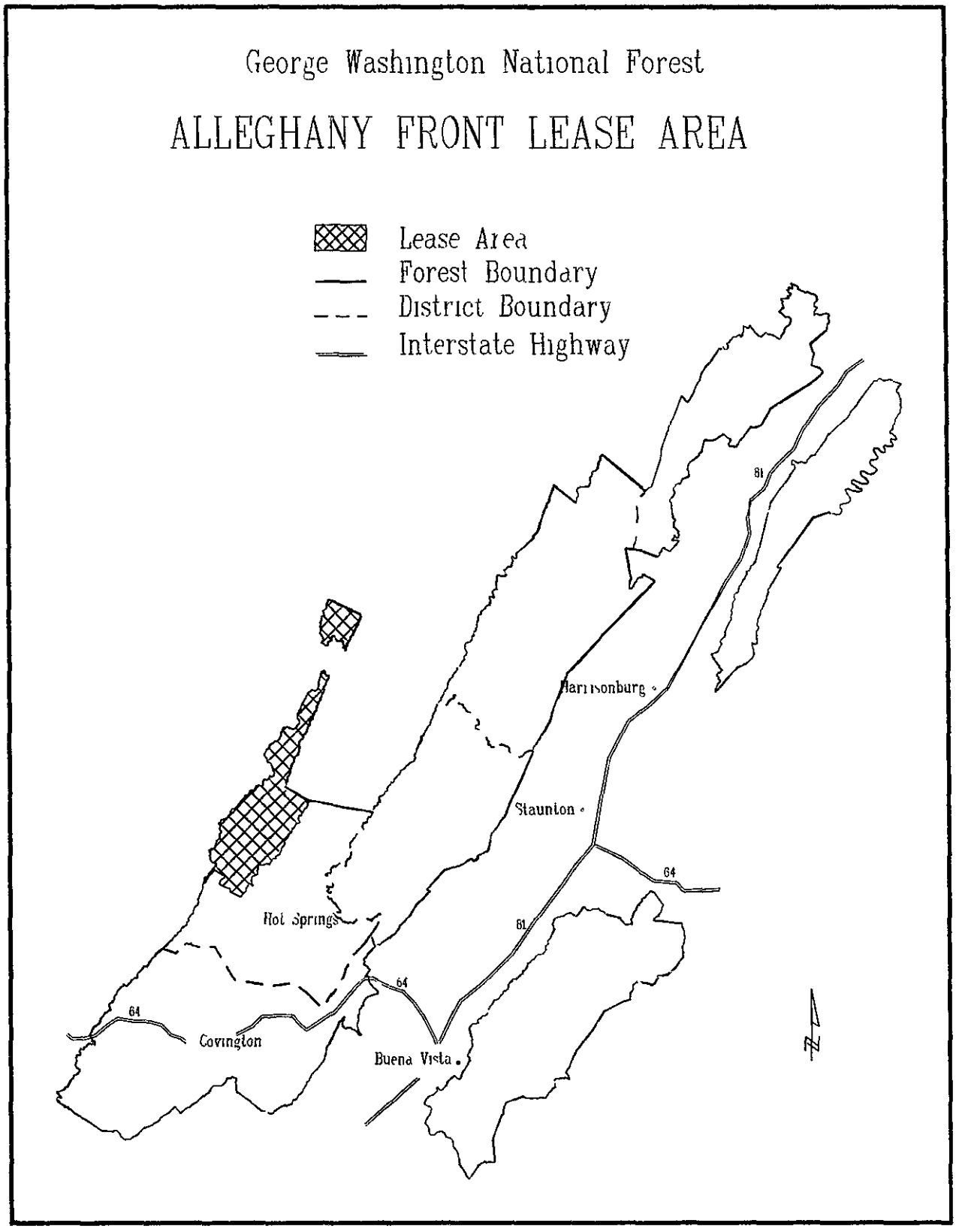
The **remaining alternatives** have varying amounts of acres available for activities under the leasable and salable mineral categories. **All alternatives** except **Alternative 3** use varying stipulations to restrict or prohibit surface occupancy in specific areas. **Alternatives 4 and 5** use the least amount of restrictive stipulations while **Alternatives 6, 9 and 13** use the greatest amount. The **remaining alternatives** lie in between.

All congressionally designated wilderness areas have minerals withdrawn from the Federal leasing and mining laws. Administrative withdrawal of minerals varies among alternatives and within mineral categories. **All other alternatives** except **Alternative 3** allow for leasing of energy minerals but use varying amounts of the very restrictive "No Surface Occupancy" stipulation to prohibit surface disturbance in specific areas. Under the categories leasable non-energy and salable minerals, administrative withdrawals of minerals range from a low of 17,000 acres to a high of 1,029,000 acres. Withdrawals are generally tied to developed recreation areas, biologic, historic, and geologic areas and special uses

Given the overall low potential of the Forest for most mineral resources, the differences among the **various alternatives** would not necessarily result in a difference in acres of actual surface disturbance, tons of soil loss through construction activities, number of wells drilled, etc. Just because more or less land might be available doesn't mean that industry will rush in and try to develop mineral resources. In fact, current and past activity levels are low despite the general availability of lands for mineral exploration and development. Rather, the main difference will be in acres available for industry to consider for exploration or development of minerals in the future as mineral commodities, uses of minerals, and new technologies change

Alleghany Front Lease Area

The map on page 3-73 shows the portion of Warm Springs Ranger District that is designated the Alleghany Front Lease Area (AFLA). The AFLA contains the Laurel Fork Roadless Area and national forest lands to the south and southwest along the trend with Alleghany Mountain. The potential for natural gas deposits on the AFLA is considered to be the highest for the Forest. A decision to lease (or not to lease) federal oil and gas rights on specific lands in this 75,000-acre area will be based on the following analysis. This decision determines the lands administratively available for leasing and the specific lands offered for leasing.


George Washington National Forest
ALLEGHANY FRONT LEASE AREA
Lease Area
Forest Boundary
District Boundary
Interstate Highway
Harrisonburg
Staunton
Hot Springs
Covington
Buena Vista
81
64
61
N

The Alternatives

Table 3-15 displays the different leasing decisions about the AFLA that are pursued in the fourteen alternatives considered in detail in the FEIS:

Table 3-15
Acres (by thousands) the Forest Service Consents to Lease Oil and Natural Gas in the Alleghany Front Lease Area[1]

Alternatives	Lease with Standard Lease Terms	Lease with Leasing with Stipulations	Lease with No Surface Occupancy	Unavailable due to Administrative Action
2	The decision to consent to leasing is deferred and evaluated with each proposal			
3	0	0	0	75
4	65	9	1	0
5	65	9	1	0
6	3	71	1	0
7	10	64	1	0
8	5	69	1	0
8A	5	69	1	0
9	0	74	1	0
10	40	34	1	0
11	0	74	1	0
12	27	47	1	0
13	0	74	1	0
14	5	69	1	0

[1]The above acreage figures do not distinguish between federal and private mineral rights. Approximately 19 percent of the Forest contains private mineral holdings on which development rights may be reserved or outstanding.

Alternative 2 assumes that no "consent" decision will be made of the AFLA. Instead, any decisions to consent to leasing would be made on a case-by-case basis as lease applications are received.

Alternative 3 does not allow mineral leasing in the AFLA, including the Laurel Fork Roadless Area.

Alternatives 9, 11 and 13 propose the Laurel Fork Roadless Area for wilderness designation. During the interim period, this area is managed under controlled-use stipulations on any leases issued. See Exhibit 3 of Appendix E for a description of the Controlled Surface Use Stipulation.

Laurel Fork is established as a Special Management Area (Management Area 21) in the Forest Service preferred alternative (**Alternative 8A**). A map of the Laurel Fork Roadless Area follows. Since part of the Laurel Fork Roadless Area is under a communitization agreement, the Forest Service cannot prevent the lessee from drilling. The Forest Service does, however, approve all Surface Use Plans of Operation prior to BLM approval of the Application to Drill (APD). Detailed plans must be submitted for any lease activity and must be approved by the Forest Service and other appropriate agencies before any mineral development takes place. Specific concerns about the effect of any drilling

George Washington National Forest
Dry River Ranger District

LAUREL FORK
Management Area 21

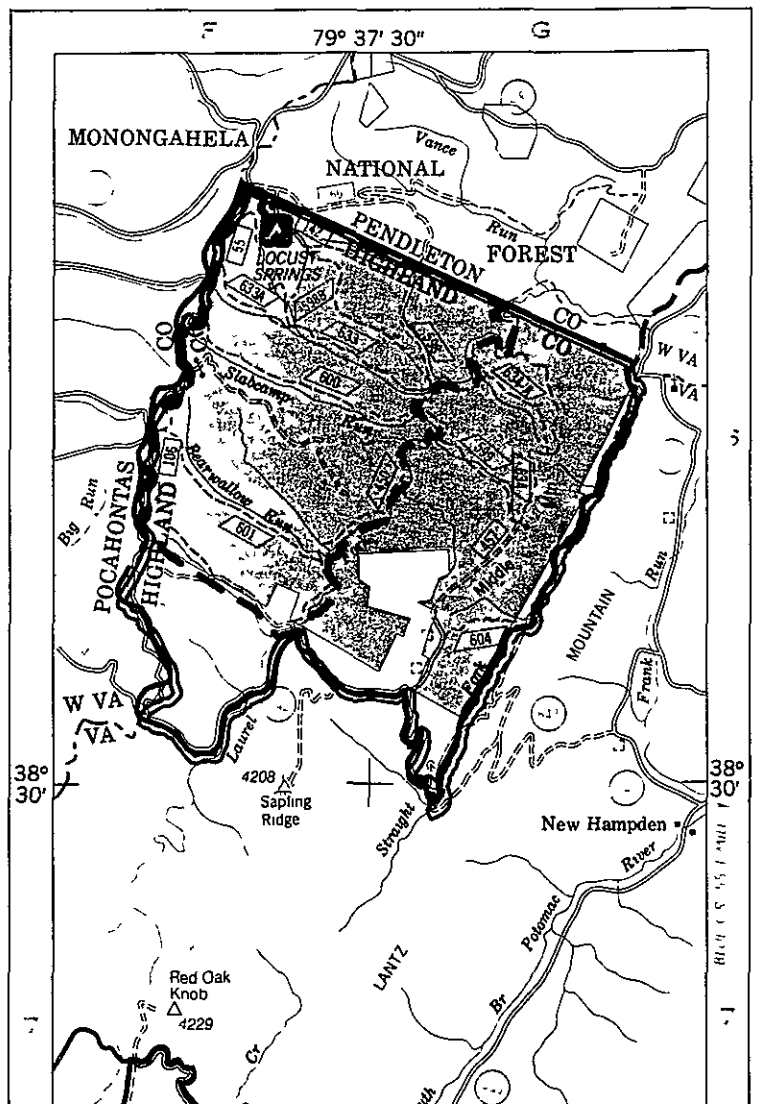
Scale

1:126,720
1/2 inch = 1 mile

Legend

Management Area 21 Boundary

Special Biological Area



operation are addressed in the Surface Use Plan of Operations For those portions of Laurel Fork outside the area under communitization agreement, controlled surface use or timing stipulations would be attached to any oil and gas leases issued. Mitigating measures will include application of Common Standards and specific management area standards to stipulations and conditions of approval. Mitigating measures would include such protections as:

1. limiting access and development to the ridgetop areas, thereby excluding surface development below the 3600' elevation;
2. using existing roadbeds for access whenever possible;
3. limiting construction to times of the year when wildlife are less affected,
4 conducting biological assessments and/or biological evaluations for the threatened, endangered and sensitive species near proposed facility sites to avoid or minimize adverse biological effects;
5 consulting with experts including the U S. Fish & Wildlife Service for information on APDs and specific constraints needed in leases;
6 prohibiting ground disturbing activities and well pads from riparian areas of Laurel Fork and its tributaries; and
7. relocating proposed operations up to 656 feet (200 meters) to avoid sensitive areas Relocation of operations up to 656 feet is a standard lease right.

Existing leases, as well as any new leases, would have conditions of approval attached to Application for Permit to Drill which would include similar mitigating measures

Alternative 7 allocates all of the Laurel Fork Roadless Area to Management Area 14. Controlled surface use or timing stipulations would be attached to any oil and gas leases issued in this area. Mitigating measures for new leases would be the same as described above for Management Area 21.

The west side of Laurel Fork is proposed as a Special Interest Area-Biological (Management Area 4) under **Alternatives 4, 5, 6, 8, 10 12 and 14**. Controlled surface use or timing stipulations would be attached to any oil and gas leases issued in this area under these alternatives. Mitigating measures for new leases would be the same as described above for Management Area 21.

The eastern and southern sections of the Laurel Fork Roadless Area have varying management areas allocated to them by alternative (see maps of alternatives) Mitigating measures will include application of Forest and specific management area standards to stipulations and conditions of approval. This part of Laurel Fork would be available for natural gas leasing with appropriate stipulations in **Alternatives 4, 5, 10 and 12**. It would be available for leasing with timing or controlled use stipulations in **Alternatives 6, 8 and 14**

Within the AFLA, two other areas of special interest, House Hollow and Paddy Knob, are identified in **Alternatives 4, 5, 6, 8, 8A, 9, 10, 11, 12, 13 and 14** as Special Interest Areas-Biological (Management Area 4) and are protected through controlled surface use stipulations on any leases issued. Additionally,

no surface occupancy stipulations are used in riparian areas (Management Area 18 or 19) within this area.

Reasonably Foreseeable Development Scenario

Appendix E contains a detailed description of the Reasonably Foreseeable Development Scenario. This analysis discloses that two to five wells could be placed on the Warm Springs Ranger District under the medium to high levels of industry activity (refer to Table E-1). Two to four of these wells could be producers (refer to Table E-2). Tables E-1 and E-2 provide information on the amount of disturbance from drilling and production. The total disturbance would involve 11 to 22 acres in the medium to high level of "Industry Activity".

The Thornwood-Horton Gas Field in West Virginia/Virginia has known gas potential Gas reserves were discovered at a depth of roughly 5,200 feet within a faulted anticlinal structure in the Devonian-aged Oriskany Sandstone Drilling on neighboring Monongahela National Forest in West Virginia began in 1961 and ceased in 1964; six gas wells capable of production were drilled in this structure Currently, these gas wells located in this remote field are shut-in, awaiting a natural gas pipeline. The Thornwood-Horton gas field has the potential for both natural gas production and later, as a natural gas storage area for the low demand summer months. Most of this field, as presently defined, lies on the West Virginia side of the state line but part of the field is within the Laurel Fork Roadless Area on the Warm Springs Ranger District. Additional drilling could expand the area within the known gas field to other parts of Virginia.

Issued leases cover 94 percent, approximately 9,768 acres, of the Laurel Fork Roadless Area Depending on their respective issuance dates, these leases are set to expire between 1996 and 1998, unless production is established Federal oil and gas lease BLM-A-0022918, containing 2,168 acres in the western portion of Laurel Fork, is within the known geologic structure of the Thornwood-Horton Gas Field and is being held under a communitization agreement (CA) with the Bureau of Land Management This communitization agreement supersedes the original lease and determines the rules for the production of natural gas. The CA does not have an expiration date. Annual rentals are still collected on the CA while production is inactive.

Any drilling and production within the AFLA would most probably occur on the 2,000 acres in the western portion of the Laurel Fork Roadless Area that are within the CA. Development would proceed from the West Virginia portion of the field. Most likely any wells would be located in proximity to the West Virginia line to minimize the amount of gathering pipelines. Access roads and gathering pipelines would most likely follow existing roads or old railroad trams to reduce the expense of construction.

As discussed in Appendix E, the typical well site area would comprise 3/4 of an acre The average length of the typical access road would be 1/2 mile. The

average length of a gas gathering pipeline would be about one mile with a 25-foot right-of-way.

Laurel Fork Roadless Area

The 10,000-acre Laurel Fork Roadless Area Area is located in northwest Highland County, Virginia on the Warm Springs Ranger District, George Washington National Forest. It takes its name from the main stream, a branch of the Potomac River, which bisects it. The area is bordered on the west by the Greenbrier Ranger District and on the north by the Potomac Ranger District of the Monongahela National Forest in West Virginia.

Laurel Fork is unique in the state of Virginia resulting, in part, from the area's location on a high, stream-dissected plateau of Alleghany Mountain. The elevations, ranging from 2,700 feet to over 4,000 feet, have given rise to a forest of northern hardwoods and montane red spruce, quite unlike the Appalachian oak forest that dominates the rest of the George Washington National Forest. This type of environment is common in West Virginia Laurel Fork is the eastern edge of a much larger area with a similar environment.

In the 1920's, red spruce was the dominate tree species in the area Railroad logging and at least one intense forest fire changed the ground conditions so that the spruce stands were largely replaced by northern hardwood species, such as sweet birch, yellow birch, black cherry and sugar maple which regenerate quickly following disturbances. Remnants of the original spruce stand remain in isolated clumps Some red spruce natural regeneration is returning under the now present northern hardwood overstory.

6,000 acres west of Laurel Fork are considered to contain unique biological values There are at least 25 species of flora and fauna that are ranked by the Virginia Division of Natural Heritage as rare in the state of Virginia including the northern flying squirrel, listed as Federally endangered, and the snowshoe hare and water shrew listed by the Commonwealth of Virginia as endangered.

Environmental Effects

This section describes the environmental effects of the reasonably foreseeable development scenario described above and in Appendix E The effects are described based on the assumptions that no drilling would occur in **Alternatives 3, 9, 11 and 13** prior to wilderness designation. If such development were to occur, the environmental effects described for **Alternatives 2, 4, 5, 6, 7, 8, 8A, 10, 12 and 14** would occur.

Eight wells were drilled in the early 1960s in the Thornwood-Horton Gas Field in the part of West Virginia adjacent to the Laurel Fork Roadless Area. Two wells were dry holes. Six wells discovered gas and are capable of gas production, awaiting construction of a gas pipeline The wells are maintained and tested periodically to insure they are still capable of production. The wells have been in place for about 30 years, and provide experience for assessing the impacts of similar activities in Laurel Fork

The vegetative clearing, ground disturbance, well pad construction, drilling, and well pad revegetation are the same type of activities that would occur during gas development in Laurel Fork. The environmental conditions where the wells were drilled is generally similar to the environment where gas wells would be drilled in Laurel Fork.

Pipelines would require some additional clearing. However, most of the pipelines would be buried within the clearing for the road right-of-way, and therefore, the effects generally coincide with the effects of road construction. Some small structures, such as gas meters, would be placed near the well heads, if production is started.

The Monongahela National Forest assessed the environmental effects of their proposed oil and gas leasing program in their *Oil and Gas Leasing and Development Environmental Assessment* (dated August 15, 1991). The Reasonably Foreseeable Development Scenario for the George Washington National Forest includes the development of the portion of the Thornwood-Horton Gas Field in Virginia. The small magnitude of development in Virginia should not cause any cumulatively significant impacts with oil and gas development in West Virginia. Even at the high level of industry activity, the level of development in Virginia would be less than 10 percent of the level of development in West Virginia.

Air Quality

Alternatives 3, 9, 11 and 13: There would be no exploration and production of natural gas in the Laurel Fork Roadless Area as all leases would be denied any activity upon them. The federal government would have to purchase mineral rights and no further leasing activity would occur. Therefore, there would be no effects on the air quality of Laurel Fork from mineral activities.

Alternatives 2, 4, 5, 6, 7, 8, 8A, 10, 12 and 14: Air quality would be slightly affected locally by all stages of development, including exploration, development, production, and abandonment. Dust created during geophysical operations, construction and use of roads, drilling pads, and pipelines would be localized and of short term duration. Emissions from vehicles and stationary engines used for transport and drilling operations would also contribute to particulate loading. During production, potential pollutants such as carbon monoxide, hydrocarbons, nitrogen oxides, sulphur oxides, and hydrogen sulfide could result from the release and flaring of natural gas. Locally significant air pollution could occur during production if a system failure results in accidental explosions or blowouts, which are rare occurrences. Air contamination from gas operations would cease on abandonment.

Since natural gas will be the product which is produced and sold, measures to contain the gases and prevent emissions are standard practice Blow-out preventers would be used where warranted.

Cumulatively, impacts to air quality from gas operations would be insignificant under any reasonably foreseeable development scenario.

Cultural Resources

Alternatives 3, 9, 11 and 13: There would be no impacts on historic or prehistoric cultural resources of the area due to exploration and/or production of natural gas.

Alternatives 2, 4, 5, 6, 7, 8, 8A, 10, 12 and 14: Exploration and production activity would have minimal effects on the cultural resources of the AFLA.

The steeply sloping areas have virtually no potential to contain cultural resource sites. Gently sloping areas do have potential for prehistoric campsites. Exploration and production activity for natural gas could affect cultural resources Most of these impacts would be created by the surface disturbances associated with gas exploration and development. As a mitigating measure, a cultural survey will be conducted before any ground disturbance. Generally, the specific locations of exploration and production activity is flexible, so most impacts to cultural resources can be avoided by relocating the developments. If this is not possible, mitigation would be prescribed for significant sites in accordance with Forest Service policy and Federal regulations. Section 6 of the standard lease terms provides guidance for the protection of archaeological sites, threatened and endangered species, or objects of historic or scientific interest that might be discovered as a result of production operations.

Because cultural surveys are required for oil and gas operations, these operations provide the opportunity to discover cultural resources and to add to our knowledge of past cultures.

Fisheries

Alternatives 3, 9, 11 and 13. There would be no exploration and production of natural gas in the Laurel Fork Roadless Area as all leases would be taken and no further leasing activity would occur. Therefore, there would be no effects on the water quality of this roadless area from mineral activities.

Alternatives 2, 4, 5, 6, 7, 8, 8A, 10, 12 and 14: Gas development activities would encompass the headwaters of six watersheds that flow into Laurel Fork. These watersheds all contain native brook trout Gas developments and geophysical operations could impact aquatic resources through sedimentation without site specific protective stipulations or conditions of approval. Site specific conditions of approval, common standards and riparian standards and guidelines are expected to make cumulative impacts to aquatic resources insignificant. No native brook trout streams should be eliminated or reduced in their classification status.

Recreation

Alternatives 3, 9, 11 and 13: Recreation opportunities would remain as is under this alternative.

Alternatives 2, 4, 5, 6, 7, 8, 8A, 10, 12 and 14: The AFLA contains opportunities for dispersed recreation activities such as hunting, hiking, backpacking, camping, and, to a small extent, ski touring. The western edge of the area has very little opportunity for water related activity, but fishing is good on Laurel Fork.

The western part of the area offers a semi-primitive motorized character while the rest of the area is semi-primitive non-motorized.

It is anticipated that up to four of the two to five wells that would be drilled under a medium to high activity level would be producers with each well pad covering an acre. Counting access roads, the total area of physical impact could reach about 15 acres.

Negative impacts on the dispersed recreation opportunities will occur only during the drilling phase when heavy equipment and vehicles will be present. This is anticipated to be a short duration impact. Upon completion of the wells and subsequent production, the area will retain its semi-primitive motorized character with impacts limited to the area immediately adjacent to the one acre well pads.

Roadless Areas

Alternatives 3, 9, 11 and 13: There would be no exploration and production of natural gas in the Laurel Fork Roadless Area as all leases would be "taken" and no further leasing activity would occur. Therefore, there would be no effects on the wilderness attributes of this roadless area from mineral activities.

Alternatives 2, 4, 5, 6, 7, 8, 8A, 10, 12 and 14: Wilderness values would be affected by natural gas exploration and production. Drilling rigs would cause significant negative impacts to the audible and visual values for the duration of the drilling operation. Surface disturbances, clearing for the well pad and installation of equipment, would also cause visual impacts. Most of the area is not steeply sloped and these negative visual impacts could be rehabilitated if a well were shut in or abandoned. With production, impact would be limited to the one acre well pad area and the access road except during maintenance operations Distribution pipelines would be along the access roads. Seismic exploration would create minor impacts

These impacts, resulting in an apparent loss of the natural integrity of the area and a noticeable loss of solitude, would impact wilderness values negatively for anywhere from a few seconds in the case of noise to several years in the case of surface disturbances

Social and Economic Setting

The Nation's need for gas is expected to continue for the foreseeable future. Congress is now working on legislation to promote natural gas as an alternative fuel to gasoline for cars. Natural gas is also seen as a cleaner burning fuel in other applications. Because of the environmental benefits of using gas rather than oil or gasoline, it appears that the use of gas will actually increase in the coming years.

Alternatives 3, 9, 11 and 13: There would be no exploration and production of natural gas in the Laurel Fork Roadless Area as all leases would be "taken" and no further leasing activity would occur. Therefore, there would be no gas revenues to Highland County, other Counties, or to the U.S. Treasury.

Alternatives 2, 4, 5, 6, 7, 8, 8A, 10, 12 and 14: Assuming that only four producing wells are found in the Laurel Fork Roadless Area, Highland County and other counties within the Forest would receive the counties 25 percent share of Federal gas royalties. It is expected that those counties would receive hundreds of thousands of dollars. The gross sales of gas from the four wells can be expected to be millions of dollars. The U.S. Treasury would receive 12-1/2 percent royalty on gross sales.

Soils

Alternatives 3, 9, 11 and 13: There would be no exploration and production of natural gas in the Laurel Fork Roadless Area as all leases would be "taken" and no further leasing activity would occur. Therefore, there would be no effects on the soils of this roadless area from mineral activities.

Alternatives 2, 4, 5, 6, 7, 8, 8A, 10, 12 and 14: Development is likely to affect soils through disturbance and soil compaction. Soils disturbed by building drilling pads, access roads, geophysical operations, and pipelines would be prone to accelerated erosion due to removal of protective vegetation and litter cover. Compaction resulting from the weight of trucks or other heavy equipment can reduce infiltration capacity of the soil, leading to increased surface runoff and the possibility of accelerated erosion; however, long-term reductions in soil productivity from compaction will not occur.

Soils in the Allegheny Front area are of the Gilpin, Berks, Calvin, and DeKalb soil series, and, on lower slopes, the Jefferson soil series. These soils have a moderate to severe probability of soil erosion if erosion control stipulations or conditions of approval are not implemented

Erosion would be minimized through stipulations or conditions of approval regarding siting and design of facilities, timing of operations, and interim and final restoration measures.

Soils could also be affected by spills of toxic or saline fluids, which could sterilize the soil and kill vegetation. Effects could be severe, but would be localized. Although spills occasionally occur, they are not usual occurrences in exploration and production. A Spill Prevention Control and Countermeasures Plan is prepared for each site. This plan specifically discusses countermeasures used to minimize the possibility of spills. Conditions of approval on the construction, lining, and use of reserve pits that would minimize the possibility of spills are measures discussed in this plan.

Threatened, Endangered and Sensitive Species

There are seven federally listed and twelve state (Virginia) listed species that are known, or are likely, to occur within the AFLA. These species are shown in Table 3-16 with their status and generalized preferred habitat.

Alternatives 3, 9, 11 and 13: There would be no exploration and production of natural gas in the AFLA including the Laurel Fork Roadless Area since all leases would be "taken" and no further leasing would occur. Therefore, there would be no effects to any threatened, endangered, or sensitive plant or animal species which may occur in the area due to lease activities.

Alternatives 2, 4, 5, 6, 7, 8, 8A, 10, 12 and 14: Exploration and production activity would have minimal, if any, effects to any threatened, endangered, or sensitive (TES) species which may occur in the area. Most effects would be associated with exploration and development activities that disturbs or destroys habitat which supports the occurrence of a TES species All activities that involve leases will require the preparation of a Biological Assessment and/or Biological Evaluation which determines effects on the TES species and outlines appropriate mitigation measures. Sensitive species, no matter where they occur within the AFLA, will be protected to ensure viable populations and suitable associated habitat. Controlled surface use and timing stipulations along with application of Forest-wide and specific Management Area standards will reduce or eliminate most adverse impacts. Generally, specific locations of exploration and production activity is flexible, so impacts to TES species can be avoided by relocating the development and confining disturbance to previously disturbed areas. Federally listed species will require compliance with the Endangered Species Act with species protection and recovery objectives outlined in the Recovery Plan prepared for each species. The Forest will cooperate fully with the protection and recovery objectives set forth by the state for state listed species

The Laurel Fork Roadless Area is known to support three listed species. The Virginia northern flying squirrel is listed as endangered on a Federal level and by Virginia while the water shrew and snowshoe hare are listed as endangered by Virginia.

Table 3-16.
Federal and state (Virginia) listed species which occur or are likely to occur within the Alleghany Front Lease Area (AFLA).

COMMON NAME	SCIENTIFIC NAME	STATUS		HABITAT WITHIN AFLA
		Federal	Virginia	
James spinymussel	Pleurobema collina	E	E	aquatic, upper James River tributaries
Peregrine falcon	Falco peregrinus	E	E	rock outcrops and cliff faces for nesting
Bald eagle	Haliaeetus leucocephalus	E	E	large trees and snags near riparian area for nesting
Loggerhead shrike	Lanius luconicianus migrans	C2	T	open fields with scattered shrubs and fence rows
Appalachian Bewick's wren	Thryomanes bewickii altus	C2	E	shrubby thickets with grassy openings
Eastern cougar	Felis concolor couguar	E	E	remote forests, all types
Virginia northern flying squirrel	Glaucomys sabrinus fuscus	E	E	late successional and old growth red spruce - northern hardwood forests
Snowshoe hare	Lepus americanus virginianus	---	E	shrubbed openings within red spruce - northern hardwood forests
Southern rock vole	Microtus chrotorrhinus carolinensis	C2	E	cool, moist, high elevation rocky woods
Indiana bat	Myotis sodalis	E	E	caves, forages and roosts in riparian areas
Virginia big-eared bat	Plecotus townsedii virginianus	E	E	caves, forages in mixed woods and open fields
Southern water shrew	Sorex palustris punctulatus	C2	E	high elevation cool, moist riparian areas

E = Endangered; T = Threatened, C2 = candidate for listing, additional information required

The Virginia northern flying squirrel is known to occur in late successional and old growth red spruce and adjacent northern hardwood forests with moist, thickly vegetated herbaceous understory conditions, large widely spaced trees with closed canopies and an abundance of standing and down snags The Laurel Fork Roadless Area is listed as a Geographic Recovery Area by the USFWS in the species Recovery Plan. Exploration and development of any oil and gas leases within this area would follow the suggested guidelines for habitat identification and management as presented in Part 2, Appendix A of the Final Recovery Plan for the Appalachian Northern Flying Squirrels. Briefly stated this will involve not disturbing areas to the fullest extent possible within 1/2 mile of occupied sites determined by trapping or observation and working closely with wildlife biologists and the USFWS to determine appropriate management measures. The Forest Service will continue to assist with inventories now underway to determine the extent of occurrence and better delineate preferred habitat conditions on the Forest. Implementation of these guidelines along with mitigation measures, controlled surface use, and timing stipulations will ensure that there will be no effect due to mineral lease activity to the continued existence of the northern flying squirrel in the AFLA.

Until recently the water shrew was known in Virginia from a single occurrence within the Little Back Creek watershed of Bath County. The species is now known to occur in the Laurel Fork watershed along a tributary within the Laurel Fork Roadless Area. This species is riparian dependent and never seen far from flowing water Habitat characteristics include swift flowing, rocky bedded streams, usually with moss covered rocks and rhododendron on the banks, and with yellow birch as one of the dominate overstory trees Other tree associates include sugar maple, beech, eastern hemlock, and red spruce. Any disturbances which adversely affect water quality or associated riparian area may prove detrimental to the water shrew. Protection of the aquatic and riparian ecosystem within the AFLA and Laurel Fork Roadless Area will receive the utmost attention with regards to mitigation measures and controlled surface use associated with lease activities. The Forest Service will follow the guidelines set forth in the Appalachian Water Shrew Recovery Plan for Virginia prepared by the Virginia Department of Game and Inland Fisheries and will cooperate and support continued inventories for the species.

The snowshoe hare is extremely rare in Virginia with only a few dozen individuals remaining in the western portion of Laurel Fork where red spruce, rhododendron, and mountain laurel are found. This hare is indigenous to the boreal forests where there is a thick evergreen understory cover. Loss of habitat due to the even-age succession of forests is the primary threat to the remaining population. Any management or development activity which would create a mosaic of early successional habitat with 40 percent to 100 percent horizontal vegetation densities would benefit this species. Therefore, if development activities associated with mineral leases was located in habitat not suitable for northern flying squirrels and water shrews and was maintained in an early

successional state with shrubby vegetation for snowshoe hares it would not adversely affect and may prove beneficial for all Federal and state endangered species known to occur in Laurel Fork.

Vegetation

The Laurel Fork Roadless Area contains one of the finest examples of northern boreal natural community complexes in Virginia and is the only area representative of the Alleghany Plateau Ecoregion within the Commonwealth.

Alternatives 3, 9, 11 and 13: There would be no negative impacts on the vegetation within Laurel Fork as there would be no development activities.

Alternatives 2, 4, 5, 6, 7, 8, 8A, 10, 12 and 14: Vegetation would be minimally affected by even the "high level" of industry activity. All vegetation would be removed from the 11 to 22 acres of well sites, reserve pits, gathering pipelines and new access roads leading to the well sites unless these activities were located on existing roads or rights-of-way. Since the size of these impacted areas is small, the overall impact on the vegetation of the AFLA and Laurel Fork is minimal. Revegetation or restoration of disturbed areas after completion of gas extraction may eventually result in similar vegetation being established. Exploration and development activities will be located in previously disturbed areas as much as possible to avoid unique or outstanding examples of forest or other vegetation types. This will be done through the controlled surface use stipulations and Forest-wide or management area standards.

Visuals

Alternatives 3, 9, 11 and 13: There would be no negative impacts on the visual resources of the Laurel Fork Roadless Area as there would be no development activities.

Alternatives 2, 4, 5, 6, 7, 8, 8A, 10, 12 and 14: The most significant visual impacts from natural gas well development would occur during the drilling operation and subsequent maintenance periods. Drilling rigs and other equipment would give the area an industrial look out of character with the surrounding landscape. The negative visual impacts from drilling would include the construction of well pads and access roads along with the operation and sight of the necessary drilling equipment. A normal drilling operation would require about three months, beginning with site-clearing and ending with total site restoration. The area is moderately sloped and steep cut slopes would likely not be necessary in the construction of roads.

With production operations, there would be minimal disturbance, limited to the immediate area of the well head and the access road. Given the latitude for well pad location contained in existing regulations, the negative visual impacts could be easily mitigated during the production phase. Production facilities could be screened by vegetation or located behind topographic features so as to minimize sight from visually sensitive travel ways.

Water

Alternatives 3, 9, 11 and 13: There would be no exploration and production of natural gas in the Laurel Fork Roadless Area as all leases would be "taken" and no further leasing activity would occur. Therefore, there would be no effects on the water quality of this roadless area from mineral activities

Alternatives 2, 4, 5, 6, 7, 8, 8A, 10, 12 and 14: Gas development activities would encompass the headwaters of six watersheds -- Buck Run, Locust Spring Run, Slabcamp Run, Lost Run, Bearwallow Run, and Newman Run -- all of which flow into Laurel Fork All of these streams are native trout streams.

Gas development and geophysical operations could impact these streams through sedimentation resulting from soil disturbance. Mitigating measures specified in stipulations or conditions of approval will lessen or eliminate these impacts. Annual sedimentation is expected to average an additional 28 tons under a high level of activity. This is small when compared to the estimated existing sediment level with no activity of 127 tons per year and is expected to have no significant effect on the beneficial uses of area streams or to the stream and riparian biota

Accidental spills of fluids could have minor localized effects if they reach perennial streams. A Spill Prevention Control and Countermeasures Plan is prepared for each site. Conditions of approval regarding the handling, storage, and disposal of fluids minimize the possibility of spills. Since the Forest Service can require the relocation of proposed operations by up to 656 feet, it is unlikely that a gas well would be located near a stream Thus the likelihood of spilled fluids reaching a stream are further reduced.

Groundwater aquifers will be protected through such measures as casing and cementing drill holes, plugging abandoned holes, and properly handling and disposing of produced fluids.

In summary, with the use of protective stipulations or conditions of approval, cumulative impacts to the quality of surface and ground water are expected to be insignificant.

RANGE

Grazing is a minor use on this Forest (approximately 250 acres in five pastures) Pasturelands are bottomlands located along the South Fork of the Shenandoah River and Cedar Creek on the Lee Ranger District. The land, when acquired, was already in use for grazing and crops. Soils are generally rich, the slopes gentle, and grassy/herbaceous vegetation abundant. Livestock numbers and seasons of use are controlled by permit

Effects of the Alternatives

In **Alternatives 3, 6, 9, 11, and 13,** the grazing program is discontinued. **Alternatives 2, 4, 5, 8, 8A, 10, 12, and 14** continue the current program. **Alternative 7** modifies and reduces the program after completion of site specific analysis on each area.

In **alternatives** that discontinue the grazing program, the following vegetation changes take place. Vegetation composition shifts towards an "old field" condition dominated by invader species such as little bluestem, blackberry, and pokeberry. Light-seeded tree species become established, including pines, sycamore, maple, and box elder Persimmon and sassafras, common edge species in these areas, also increase in abundance. These areas eventually become totally forested, advancing in age and changing in species composition from intolerant to tolerant species. Exceptions include the sycamore and box elder that inhabit river bank areas

In **alternatives** that continue the grazing program as is, no major changes take place. Pastures are maintained in a grass cover, and livestock numbers are controlled by permit stipulation.

ROADLESS AREAS

The Forest currently has 27 inventoried areas, a total of approximately 260,000 acres, that could be recommended for wilderness study. These areas meet the criteria for placement on the inventory as potential wilderness as set forth in Chapter 7 of FSH 1909.12 For discussion purposes, these areas are referred to as roadless areas, although some of them do contain roads -- up to one-half mile per 1,000 acres -- as permitted in the FSH.

For each roadless area, a report was prepared that evaluates its wilderness potential. These wilderness evaluation reports -- see Appendix C -- are in accord with 36 CFR 219.17. Evaluation reports consider wilderness potential in *three categories: capability -- the qualities that make a roadless area suitable* or not suitable for wilderness; availability -- an assessment of the non-wilderness resources and demands of the area; need -- a consideration of the amount of wilderness already in the area and region

A list of the roadless areas and approximate acreages follows:

Roadless Area	Current Acreage (approximate)
Adams Peak	7,076
Beards Mountain	7,457
Big Schloss	20,755
Crawford Mountain	9,868
Dolly Anne	7,804
Dry River	7,313
Elliott Knob	9,376
Gum Run	12,585
Jerkemtight	16,668
Kelley Mountain	7,632
Laurel Fork	9,938
Little Alleghany Mountain	10,109
Little River	27,248
Mill Mountain	10,826
Mount Pleasant	8,905
Northern Massanutten	9,410
Oak Knob	10,866
Oliver Mountain	13,081
Ramseys Draft Addition	12,771
Rough Mountain Addition	1,131
Saint Mary's Addition	1,441
Skidmore	5,635
Southern Massanutten	11,919

Roadless Area	Current Acreage (approximate)
The Friars	2,020
The Priest	5,726
Three Ridges	4,702
Three Sisters	8,150
TOTAL	**260,412**

With more than 260,000 acres of the Forest involved, whether or not some or all of these areas remain in a roadless condition is a public concern.

The following discussion indicates how each roadless area is allocated in the alternatives. For the purposes of this discussion, three categories are used:

1) Wilderness Study: Roadless areas recommended for wilderness study are set aside and are not available for development. A wilderness study area is managed much the same as designated wilderness until a final determination is made by Congress as to whether or not it will be added to the National Wilderness Preservation System.

Currently, the Forest has no land in the wilderness study category. The areas recommended for wilderness study vary among the **alternatives**.

2) Roadless Areas Remain Unavailable: An area that retains its roadless status is unavailable for development. It is allocated by an alternative to one of several management areas. Management areas that retain roadless qualities are:

Management Area Number	Management Area Name
1	Minimal Level Management
2	Migration Corridors
3	Critical & Municipal Watersheds
4	Special Interest Areas
5	Scenic Areas or Sensitive Viewsheds
6	The Appalachian Trail
9	Backcountry or Remote Highlands
10[1]	Scenic/Recreational Rivers
13[2]	Dispersed Recreation Areas
21	Special Management Areas

[1]Unsuitable for timber production.
[2]Portions that will not permit road construction.

Detailed descriptions of these management areas and their associated standards are in the process paper entitled *Management Area Prescriptions*.

3) Roadless Areas Become Available: In this category, areas are made available for road construction and other management activities Removal of roadless status means that changes are allowed that make an area no longer suitable for wilderness designation. Management area allocations in this category do not necessarily commit an area to development Before a decision to develop a roadless area can be made, a site specific analysis must be conducted

Management areas that allow road construction and other management activities are:

Management Area Number	Management Area Name
7	Scenic Corridors/Highland Scenic Tour
10[1]	Scenic/Recreational Rivers
11	All-Terrain/Off Highway Routes
12	Developed Recreation Areas
13[2]	Dispersed Recreation Areas
14	Remote Habitats for Wildlife
15	Mosaics of Wildlife Habitat with Freedom from Continued Disturbance
16	Early Successional Forested Habitat for Wildlife
17	Timber Emphasis
18	Riparian Areas with Ecological Widths
19	Riparian Areas with Set Widths
20	Admin/Utility/Communication Sites
22	Small Game and Watchable Wildlife

[1]*Suitable for timber production.*
[2]Portions that permit road construction.

The Alternatives

Table 3-17 displays the categories that each roadless area is allocated to by alternative. A "W" indicates that the area is recommended for wilderness study. A "U" indicates that the area retains roadless status and is unavailable for development. An "A" indicates that the area is available for development and will no longer be held in the roadless area category. In cases where one area is divided between two categories, the percentage of acres in each category is displayed.

Table 3-17.
Roadless Area/Wilderness Study Area Allocations by Alternative

	Alternative													
Roadless Area	2	3	4	5	6	7	8	8A	9	10	11	12	13	14
Adams Peak	A*	W*	A	A	W	A	A 2% U 98%	A 2% U 98%	W	A	A 2% U 98	A	W	A
Beards Mountain	A 96% U*4%	W	A 96% U 4%	U 96% U 4%	U	A 96% U 4%	U	A 3% U 97%	W	U	U	A 96% U 4%	U	A 23% U 77%
Big Schloss	A 63% U 37%	W	A 97% U 3%	U 63% U 37%	A 3% W97%	A	U	U	W	A 97% U 3%	W	A 67% U 37%	W	A 20% U 80%
Crawford Mountain	A	W	A	A	A 8% U 92%	A	U	A 14% U 86%	W	A	U	A	W	A 67% U 33%
Dolly Anne	A 75% U 25%	W	A 95% U 5%	A 75% U 25%	A 1% U 99%	A	U	A 37% U 63%	W	A 63% U 37%	U	A 75% U 25%	U	A 75% U 25%
Dry River	A 79% U 21%	W	A 79% U 21%	A 79% U 21%	A 6% U 94%	A	U	A 52% U 48%	W	A 79% U 21%	U	A 79% U 21%	W	A 79% U 21%
Elliott Knob	A 90% U 10%	W	A 90% U 10%	U 90% U 10%	A 38% U 62%	A	U	A 7% U 93%	W	A 90% U 10%	U	A 90% U 10%	W	A 90% U 10%
Gum Run	A 98% U 2%	W	A 98% U 2%	A 98% U 2%	A 3% U 97%	A	U	U	W	A 77% U 23%	U	A 98% U 2%	W	A 98% U 2%
Jerkemtight	A 95% U 5%	W	A 95% U 5%	A 95% U 5%	W66% U 33% A 1%	A	U	A 5% U 95%	W	A 42% U 58%	U	A 95% U 5%	W	A 95% U 5%
Kelley Mountain	A 1% U 99%	W	A 1% U 99%	A 1% U 99%	A 1% U 99%	A	U	A 2% U 98%	W	A 1% U 99%	W	A 1% U 99%	W	A 1% U 99%
Laurel Fork	A 39% U 61%	W	A 39% U 61%	A 39% U 61%	U	A	U	U	W	A 39% U 61%	W	A 39% U 61%	W	A 14% U 86%
Little Alleghany Mountain	A 96% U 4%	W	A 96% U 4%	A 96% U 4%	A 30% U 70%	A 96% U 4%	A 27% U 74%	A 24% U 76%	W	A 46% U 54%	U	A 96% U 4%	U	A 27% U 73%
Little River	A 50% U 50%	W	A 50% U 50%	A 50% U 50%	A 11% U 43% W46%	A	U	A 4% U 96%	W	U	W	A 50% U 50%	W	A 24% U 76%
Mill Mountain	A 98% U 2%	W	A 98% U 2%	A 98% U 2%	U 33% W67%	A 98% U 2%	A 2% U 98%	A 30% U 70%	W	A 92% U 8%	A 1% U 99	A 98% U 2%	W	A
Mount Pleasant	A 90% U 10%	W	A 90% U 10%	A 90% U 10%	U 26% W74%	A 90% U 10%	U	A 14% U 86%	W	A 5% U 95%	W	A 90% U 10%	W	A 52% U 48%

Roadless Area	2	3	4	5	6	7	8	8A	9	10	11	12	13	14
Northern Massanutten	A 98% U 2%	W47% U 53%	A 98% U 2%	A 98% U 2%	U	A 98% U 2%	A 2% U 98%	A 2% U 98%	W	U	U	A 98% U 2%	U	A 33% U 67%
Oak Knob	A 93% U 7%	W	A 93% U 7%	A 93% U 7%	U	A	U	A 14% U 86%	W	A 55% U 45%	A 2% U 98%	A 93% U 7%	W	A 93% U 7%
Oliver Mountain	U	U	A	A	U	A	A	A 61% U 39%	W	A	A 13% U 87%	A	U	A 12% U 88%
Ramseys Draft Addition	A 85% U 15%	W	A 85% U 15%	A 85% U 15%	A 3% U 23% W74%	A	U	A 1% U 99%	W	A 85% U 15%	W	A 85% U 15%	W	U
Rough Mountain Addition	A 98% U 2%	W	A 98% U 2%	A 98% U 2%	W	A 98% U 2%	U	A	W	W	W	A 98% U 2%	W	A
St Mary's Addition	A	W	A	A	W	A	W	W94% A 6%	W	W	W	A	W	W
Skidmore	A 58% U 42%	W	A 58% U 42%	A 58% U 42%	U	A	U	U	W	A 58% U 42%	W	A 58% U 42%	W	A 58% U 42%
Southern Massanutten	A	W	A	A	U	A	U	U	W	U	W	A	W	A 8% U 92%
The Friars	A	U	A	A	U	A	A	U	W	U	U	A	W	A
The Priest	A 76% U 24%	W	A 76% U 24%	A 76% U 24%	U	A 77% U 23%	W	W	W	U	W	A 76% U 24%	W	W
Three Ridges	A 58% U 42%	W	A 58% U 42%	A 58% U 42%	U 5% W95%	A 58% U 42%	W	W	W	U	W	A 58% U 42%	W	W
Three Sisters	A 82% U 18%	W	A 82% U 18%	A 82% U 18%	A 13% U 10% W77%	A 82% U 18%	U	U	W	A 82% U 18%	U	A 82% U 18%	W	A 8% U 92%
FORESTWIDE	A 80% U 20%	W93% U 7%	A 83% U 17%	A 80% U 20%	A 5% U 62% W33%	A 97% U 3%	A 6% U 89% W 5%	A 11% U 84% W 5%	W100%	A 51% U 49% W 1%	A 1% U54% W45%	A 80% U 20%	W82% U18%	A 45% U 50% W 5%

W = Wilderness Study Area, U = Unavailable for Development, A = Available for Development

For purposes of the following discussion, three roadless area values are identified. These values are remoteness, social encounters/solitude, and naturalness. Refer to the Glossary for a definition of these terms.

Alternative 2: This no-action or no-change alternative reflects the interim management direction set forth in Forest Supervisor Kelley's letter of August 14, 1990 No areas are allocated to wilderness study.

As indicated in Table 3-17, portions of 21 roadless areas are allocated to management areas that retain roadless status and remain unavailable for development.

Areas that retain roadless status on 25 percent or fewer acres are: Beards Mountain, Dolly Anne, Dry River, Elliott Knob, Gum Run, Jerkemtight, Little Alleghany Mountain, Mill Mountain, Mount Pleasant, Northern Massanutten, Oak Knob, Ramseys Draft Addition, Rough Mountain Addition, The Priest, and Three Sisters.

Areas that retain roadless status on 50 percent to 99 percent of the acres are: Kelley Mountain, Laurel Fork, and Little River. This allocation leaves a relatively large block of land in roadless status.

Areas with all acres removed from the roadless area category and made available for development are: Adams Peak, Crawford Mountain, Saint Mary's Addition, Southern Massanutten, and The Friars.

Forestwide, 80 percent of the acreage currently classified as roadless is made available for development. In most cases, the acreage that remains unavailable for development involves only a small portion of the original inventoried area. If development occurs on the available acres, it will preclude many of these areas from wilderness consideration in the future. Roadless area values, as described in the Appendix C reports, will be foregone in many areas if development occurs. Forestwide, experiences of solitude and remoteness will diminish and the Forest will appear less natural as management activities are implemented.

Alternative 3: An extensive system of wilderness and wilderness study areas is established and is linked with undeveloped migration corridors. Twenty-four roadless areas are recommended for wilderness study; 21 of the 24 increase in size One area, Northern Massanutten, is allocated in part to wilderness study; the remainder is allocated to wildlife use as unfragmented habitat and migration corridors (Management Area 2); no roads are permitted.

The only two roadless areas that are not, at least in part, allocated to wilderness study are The Friars Roadless Area on the Pedlar Ranger District and Oliver

Mountain Roadless Area on the James River Ranger District. Both areas remain roadless, however, through allocation to Management Areas 1, 2 and 5.

On a Forestwide basis, 93 percent of the roadless area acreage is recommended for wilderness study.

Forestwide and within the individual wilderness study areas, the potential is high in **Alternative 3** for experiences of remoteness and solitude. Roads and trails that are closed to create the enlarged wilderness or wilderness study areas eventually regain a natural appearance. Evidence of man's activities becomes minimal and an unaltered, natural appearance dominates the Forest

Alternative 4: With an emphasis on providing opportunities for motorized recreation, no roadless areas are allocated to wilderness study.

Substantive portions (more than 1/4 of the area) of five roadless areas are allocated to management areas that retain roadless status. Relatively large blocks of land in Laurel Fork, Kelley Mountain, Little River, Skidmore and the Priest retain roadless status.

Forestwide, on 83 percent of the current roadless area acreage, roadless area status is removed and the land is made available for resource development and road construction. This includes most, if not all of the acreage in Adams Peak, Beards Mountain, Big Schloss, Crawford Mountain, Dolly Anne, Dry River, Elliott Knob, Gum Run, Jerkemtight, Little Alleghany Mountain, Mill Mountain, Mount Pleasant, Northern Massanutten, Oak Knob, Oliver Mountain, Ramseys Draft Addition, Routh Mountain Addition, St. Mary's Addition, Southern Massanutten, The Friars, The Priest and Three Sisters. Wilderness designation will be precluded in many of the areas if development occurs on the available acres.

Considering the emphasis of Alternative 4, motorized trails may be built in areas that are presently in an unroaded condition. Improved accessibility means an overall decrease in solitude and remoteness. Forestwide, this will also have an impact on the natural appearance of the Forest.

Alternative 5: Much of the Forest is managed intensively to produce high quality timber under Alternative 5. No roadless areas are recommended for wilderness study.

Areas that retain roadless status on 25 percent or fewer acres are: Beards Mountain, Dolly Anne, Dry River, Elliott Knob, Gum Run, Jerkemtight, Little Alleghany Mountain, Mill Mountain, Mount Pleasant, Northern Massanutten, Oak Knob, Ramseys Draft Addition, Rough Mountain Addition, The Priest, and Three Sisters.

Acres retained in roadless status range from 50 percent to 99 percent of the total acres on Little River, Laurel Fork, and Kelley Mountain.

As in alternatives 2 and 4, Adams Peak, Crawford Mountain, Oliver Mountain, St. Mary's Addition, Southern Massanutten, and The Friars become available for other resource management and road construction.

Forestwide, 80 percent of the roadless acreage becomes available for other resource development and roads; 20 percent retains roadless status and remains unavailable for road construction or development. As in Alternative 2, the acreage that remains unavailable for development in many areas involves only a small portion of the original inventoried area. If development occurs on the available acres, it will preclude many of these areas from wilderness consideration in the future.

In Alternative 5, timber management activities and associated road construction could reduce solitude and remoteness on a Forestwide basis. If the roadless area acreages made available for development are accessed through road construction, the character of these areas, as described in Appendix C, will move toward one that is relatively more accessible and less natural in appearance

Alternative 6: The production of nonmarket goods and services is emphasized Eleven areas are recommended for wilderness study including Adams Peak, Big Schloss, Jerkemtight, Little River, Mill Mountain, Mount Pleasant, Ramseys Draft Addition, Rough Mountain Addition, St Marys Addition, Three Ridges, and Three Sisters. The boundaries of many of these areas are revised from the original inventory to address critical management concerns including concerns relating to the protection of threatened, endangered, and sensitive species.

In all of the areas, the majority of acres are unavailable for development and roading. At least 50 percent of every area retains its roadless status

Forestwide, 33 percent of the roadless acres are recommended for wilderness study and an additional 62 percent are unavailable for resource and road development. Only 5 percent of the roadless acres are made available for development.

Forest users will be able to find solitude and experience a feeling of remoteness in many areas throughout the Forest With management activities limited on many forest acres, the Forest will appear predominantly natural.

Alternative 7: The majority of the Forest is managed to provide wildlife habitat under Management Areas 14, 15, and 16. No roadless areas are allocated to wilderness study.

All of eighteen roadless areas are available for development. Most of the remaining roadless areas are primarily available for development Forestwide, 3 percent of the current roadless area acreage remains unavailable for development.

Under Alternative 7, virtually all acres in Adams Peak, Beards Mountain, Big Schloss, Crawford Mountain, Dolly Anne, Dry River Elliott Knob, Gum Run, Jerkemtight, Kelley Mountain, Laurel Fork, Little Alleghany Mountain, Little River, Mill Mountain, Oak Knob, Oliver Mountain, Ramseys Draft Addition, Skidmore, St. Mary's Addition, Southern Massanutten, and The Friars are available for road construction and timber harvest related to wildlife habitat management. Most new roads are closed to the general public -- unless needed seasonally -- and are used for administrative purposes only. Most of the remaining roadless areas have 10 to 48 percent of their acreage unavailable for development.

If the available acres are accessed with roads, the qualities of remoteness and naturalness will decline in most of the areas. Road construction will preclude many areas from future consideration as wilderness. Because most roads are closed, experiences of solitude will still be available, especially in areas allocated to remote wildlife habitat (MA 14).

Alternative 8: Under Alternative 8, the Forest provides unfragmented habitat for wildlife and optimum habitat for threatened, endangered, and sensitive species. Three areas are recommended for wilderness study: Three Ridges, The Priest, and St. Mary's Addition

Only 6 percent of the roadless area acreage is available for development and road construction The remaining 94 percent of the acreage is unavailable for development and road construction.

As indicated in Table 3-17, nineteen areas are completely unavailable for development: Beards Mountain, Big Schloss, Crawford Mountain, Dolly Anne, Dry River, Elliott Knob, Gum Run, Jerkemtight, Kelley Mountain, Laurel Fork, Little River, Mount Pleasant, Oak Knob, Ramseys Draft Addition, Rough Mountain Addition, Skidmore, Southern Massanutten, the Friars and Three Sisters. Three roadless areas have 2 percent of their acreage available for development: Adams Peak, Mill Mountain, and Northern Massanutten. 27 percent of Little Alleghany Mountain and all of Oliver Mountain Roadless Areas are available for development

Forestwide, recreationists will be able to experience solitude and remoteness in the areas where road construction and other management activities are prohibited or limited. Under some management area allocations, dispersed recreation may be discouraged if considered a detriment to wildlife, especially to threatened, endangered, or sensitive species. The roadless area values

described in Appendix C are retained in most of the roadless areas under Alternative 8. A natural appearance will dominate much of the Forest.

Alternative 8A: Under Alternative 8A, the roadless areas provide unfragmented habitat for wildlife and optimum habitat for some threatened, endangered, and sensitive species. Three roadless areas are recommended for wilderness study: Three Ridges, The Priest, and St. Marys Addition. 6 percent of the St. Marys Addition would be assigned to Management Area 22 and hence available for development.

As displayed in Table 3-17, only 11 percent of the roadless area acreage is available for development and road construction. The remaining 89 percent of the acreage is unavailable for development and road construction.

As indicated in Table 3-17, seven areas are completely unavailable for development: Big Schloss, Gum Run, Laurel Fork, Skidmore, Southern Massanutten, the Friars and Three Sisters. Rough Mountain Addition Roadless Area is completely available for development. Sixteen roadless areas have varying percentages of their acreage available for development ranging from 1 percent in Ramseys Draft Addition to 61 percent in Oliver Mountain.

Forestwide, recreationists will be able to experience solitude and remoteness in the areas where road construction and other management activities are prohibited or limited. Under some management area allocations, dispersed recreation may be discouraged if considered a detriment to wildlife, especially to threatened, endangered, or sensitive species. The roadless area values described in Appendix C are retained in most of the roadless areas under Alternative 8A. A natural appearance will dominate much of the Forest.

Alternative 9: The Forest is managed to provide large areas of unfragmented wildlife habitat. All twenty-seven inventoried roadless areas are recommended for wilderness study.

On a Forestwide basis, 100 percent of the roadless acres are recommended for wilderness study. With such a large amount of wilderness study acres, experiences of solitude and remoteness will be readily available. Coupled with reduced timber management and road construction programs, a large percentage of the Forest will move toward a natural appearance unaltered by management activities.

Alternative 10: A mix of resources is produced with an emphasis on minimizing net costs of the timber program. Two roadless areas, St. Mary's Addition and Rough Mountain Addition, are recommended for wilderness study.

While not recommended for wilderness study, seven roadless areas are unavailable for roads or development: Beards Mountain, Little River, Northern and Southern Massanutten, The Friars, The Priest, and Three Ridges.

Over 90 percent of two areas, Kelley Mountain and Mt. Pleasant, is unavailable for roads or resource development that might threaten the roadless area values described in Appendix C.

In seven areas, approximately 25 percent is unavailable for development. In the remaining roadless areas, the percentages of unavailable acres vary as shown in Table 3-17.

Forestwide under Alternative 10, 50 percent of the current roadless area acreage is unavailable to resource development that would diminish roadless values described in Appendix C. This includes the one percent recommended for wilderness study.

Experiences of remoteness and solitude are concentrated in areas where all or most acres are unavailable for development. Resource development and roads will decrease the natural appearance of many areas, with a resulting Forestwide decrease.

Alternative 11: Eleven areas are recommended for wilderness study: Big Schloss, Kelley Mountain, Laurel Fork, Little River, Mount Pleasant, Ramseys Draft Addition, Rough Mountain Addition, St. Mary's Addition, Skidmore, Southern Massanutten, The Priest, and Three Ridges.

In addition to the areas recommended for wilderness study, the majority of the acreage in the remaining roadless areas is unavailable for road construction. Only the Oliver Mountain Roadless Area contains a substantial amount of acreage that could be roaded

Forestwide, 45 percent of the current roadless area acreage is recommended for wilderness study and an additional 54 percent is made unavailable for development.

With all the roadless areas, solitude and a feeling of remoteness can be experienced in many parts of the Forest. An appearance of naturalness will be mixed with evidence of management activities.

Alternative 12: A full range of goods and services is provided, including a relatively large amount of timber. No areas are recommended for wilderness study.

Areas that retain roadless status on 25 percent or fewer acres are: Beards Mountain, Big Schloss, Dolly Anne, Dry River, Elliott Knob, Gum Run, Jerkemtight, Little Alleghany Mountain, Mill Mountain, Mount Pleasant, Northern Massanutten, Oak Knob, Ramseys Draft Addition, Rough Mountain Addition, The Priest, and Three Sisters.

Areas that retain roadless status on 50 percent to 99 percent of the acres are· Kelley Mountain, Laurel Fork, and Little River.

Areas with all acres removed from the roadless area category include Adams Peak, Crawford Mountain, St. Mary's Addition, Southern Massanutten, and The Friars

Forestwide, 80 percent of the roadless acres are available for road and other resource development In many areas, only a small fraction of the acreage remains unavailable and potential development will preclude them from future wilderness consideration. Development will result in an overall decrease in solitude and remoteness The Forest will appear less natural as a result of management activities.

Alternative 13: Large areas of unfragmented habitat are provided. Timber management is practiced in areas that are moderately to heavily roaded. Twenty-two areas are recommended for wilderness study: Adams Peak, Big Schloss, Crawford Mountain, Dry River, Elliott Knob, Gum Run, Jerkemtight, Kelley Mountain, Laurel Fork, Little River, Mill Mountain, Mount Pleasant, Oak Knob, Ramseys Draft Addition, Rough Mountain Addition, St. Mary's Addition, Skidmore, Southern Massanutten, The Friars, The Priest, Three Ridges, and Three Sisters. Boundary adjustments reduce the size of Jerkemtight, Little River, and Ramseys Draft Addition. These adjustments remove areas where management activities are used to improve habitat for threatened, endangered, or sensitive species.

While not recommended for wilderness study, all of the acres in Beards Mountain, Dolly Anne, Little Alleghany Mountain, Northern Massanutten and Oliver Mountain Roadless Areas remain unavailable for resource development and road construction.

With such a large number of areas/acres recommended for wilderness study or made unavailable for resource development, solitude and remoteness are available in many locations. In all of these areas, the Forest will take on a natural appearance

Alternative 14: Alternative 14 includes management that addresses local issues while providing a broad mix of goods and services.

Three areas are recommended for wilderness study: St. Marys Addition, Three Ridges and The Priest. In Ramseys Draft Addition, roadless area values are retained. More than 90 percent of Kelley Mountain, Southern Massanutten and Three Sisters remain unavailable for road construction and other resource development.

Four areas are made completely available for road construction and other resource development: Adams Peak, Mill Mountain, Rough Mountain Addition and The Friars.

Forestwide, half of the roadless area acreage remains unavailable for development Forty-five percent is available for road construction and resource development that may remove roadless area qualities.

Under Alternative 14, the number of acres where solitude and a feeling of remoteness prevail will be reduced if new roads provide access to acres allocated to management areas that permit road construction. Access and management of these areas will make the Forest less natural in appearance.

ROADS AND FACILITIES

The total road network on and through the Forest is comprised of roads under jurisdictions of the Forest Service and the states of Virginia and West Virginia. Roads under Forest Service jurisdiction are called Forest Development Roads and are often referred to as "system" roads.

Access

The road network allows the public varying degrees of access to the Forest. Portions of the Forest are surrounded by private land and in some cases, public access is difficult or impossible.

Much of the Forest is readily accessible by open road or foot-trail. Seasonally, many of these roads are closed to protect soil, water, wildlife, and the road investment; others are closed to the public year-round. The existing Forest Development Roads total approximately 1,760 miles. Of this amount, approximately 610 miles are open to the public year-round, an additional 440 miles are open seasonally, and 710 miles are closed year-round

Through agreements with Virginia and West Virginia, a group of state-owned roads that the Forest Service and cooperators use in managing the Forest are designated as Forest Highways. As such, they may become eligible for additional federal funding Forest Highways in Virginia total 695 miles; in West Virginia, 102 miles.

Standards

Roads on the Forest range from the highest standard, such as Interstate 64, to the lowest standard which is passable only by four-wheel drive vehicles. The road network is divided into three classes. arterial, collector, and local

Arterial roads are high standard state roads that cross both national forest and non-national forest land inside the Forest boundary. Arterials provide access to large areas of Forest, generally 40,000 acres-plus. None of the arterial roads are under Forest Service jurisdiction.

Collector roads are under either Forest Service or state jurisdiction. The Forest Service has jurisdiction over approximately 350 miles of collector roads. Like arterial roads, collectors are multi-purpose, but serve smaller areas -- 5,000-plus acres -- than arterials.

Local roads under Forest Service jurisdiction total approximately 1,410 miles. Additional miles of roads classified as local are under state jurisdiction. All are generally low-traffic, single lane roads.

Facilities

Other facilities on the Forest include approximately 300 buildings: administration buildings, recreation buildings, residential buildings. There are 26 dams on the Forest, 19 under permit and seven Forest-managed.

Effects of the Alternatives

Following is a discussion of how the alternatives will affect the existing roads and future road construction. Roads affect resources such as soils and access for recreation. Those effects are discussed in the individual resource sections.

Under **Alternatives 2, 6, 7, 8, 8A, 10, 11, 12, 13 and 14**, minimal change is expected in the maintenance and management of the existing roads.

In **Alternative 3**, no Forest Development Roads are allowed in Management Area 2 or Management Area 8. This calls for removal of approximately 900 miles of Forest System Roads or approximately half of the existing mileage.

Under **Alternative 4**, all gated system roads are opened to public vehicular use unless significant resource damage occurs Currently, the inventory shows approximately 500 miles of gated roads that are not opened to public vehicular use. There are currently approximately 1,050 miles of Forest System Roads opened either yearly or seasonally, so that could increase to a maximum of 1,550 miles.

Under **Alternative 5**, it is estimated that about one-third of the closed, gated roads would be opened seasonally. A total of approximately 1200 miles of *system roads would be open to the public seasonally or year-round.*

Under **Alternative 12**, it is estimated that about two-thirds of the closed, gated roads would be opened seasonally. A total of approximately 1400 miles of system roads would be open to the public seasonally or year-round.

Alternative 9 calls for closure of roads in SPM ROS category and in specific cases. It is estimated that would involve closing approximately 100 miles of road to public use.

Effects on New Road Construction. The table below shows estimated miles of new road construction per year for the first decade needed to support the timber sale program. The estimated miles are represented as a range of mileage that would be anticipated in any given year depending upon the amount of timber harvesting, type of timber harvest methods and location of the harvest units. For example, under Alternative 2, there would be 50 to 80 miles of new roads added to the existing 1,760 miles during the first 10 years to provide access to some of the lands suitable for timber production.

Additional road construction might be necessary to provide access to new developed recreation sites or wildlife habitat improvements. The table also does not include reconstruction or maintenance of existing roads.

Table 3-18.
Estimated New Road Construction

Alternative	New Construction Miles/Year First Decade
2	5 to 8
3	0
4	6 to 9
5	9 to 13
6	0
7	9 to 13
8	4 to 7
8A	5 to 8
9	1 to 2
10	2 to 3
11	0
12	7 to 11
13	0
14	5 to 8

Under Alternatives 11 and 13, timber harvesting is limited to within 1/4 to 1/2 mile of open system roads and only temporary roads or skid trails can be used to access harvest units.

SOCIAL/ ECONOMIC SETTING

For the purpose of analyzing the social and economic impacts of Forest management activities, an impact area has been defined It includes 14 Virginia counties, 10 independent Virginia cities, and five West Virginia counties.

Impact Area

Virginia Counties	Virginia Cities	West Virginia Counties
Allegheny	Bedford	Grant
Amherst	Buena Vista	Hampshire
Augusta	Clifton Forge	Hardy
Bath	Covington	Mineral
Bedford	Harrisonburg	Pendleton
Botetourt	Lexington	
Frederick	Lynchburg	
Highland	Staunton	
Nelson	Waynesboro	
Page	Winchester	
Rockbridge		
Rockingham		
Shenandoah		
Warren		

Although a greater number of residents of these cities and counties feel the effects of the Forest management decisions, residents of more distant areas -- such as Washington, D.C., Baltimore, Md , and Richmond, Va. -- also feel the effects. The Forest is the national forest closest to them.

All issues (see summary in Chapter 1, details in Appendix A) addressed in the revision of the Forest Plan are concerns of individuals and organizations affected by the management of the Forest. How well the revised Forest Plan resolves or addresses these issues will affect these individuals and organizations socially and economically.

As discussed in the process paper *Economic Diversity and Dependency Assessment*, the economy of the region is relatively diverse with no dependency on a single industrial sector (refer to the breakdown of major industrial sectors on the next page).

Effects of the Alternatives

It is difficult to assess the absolute social and economic effects of the alternatives in terms of the 19-county impact area. Western Virginia and adjoining West Virginia are undergoing social and economic changes that far outweigh the consequences of policies contained in the **alternatives**. The consequences of any policy changes in the management of the Forest may often be compensated by changes in the economy as a whole.

The socio-economic consequences of the alternatives presented here need to be viewed as relative indicators of change rather than assessments of absolute changes that would occur in the Forest social impact area. For analysis purposes, the socio-economic consequences are based upon changes to a stagnant 1985 economy in the impact area. These predicted changes would have validity as absolute indicators only if no other factors were acting upon this economy. The analysis techniques are discussed in Appendix B

Employment

Based on 1985 information, 240,263 persons are employed in the Forest impact area. Broken down by major industrial sectors, percentages of total employment are:

Major Sector	Percentage of Total Employment
Agriculture, Forestry & Fisheries	6.89
Mining	0.78
Construction	6.68
Manufacturing	22.87
Transportation, Communications & Utilities	12.95
Wholesale & Retail Sales	11.99
Finance, Insurance & Real Estate	2.69
Services	21.23
Government Enterprises	0.85
Special Industries	13.07

The effect of **the alternatives** on employment in the local timber industry has been identified as an issue to be addressed in the Forest Plan Revision.

Table 3-19 on the next page displays the changes in employment that could occur as a result of the management practices and policies contained in **the alternatives**. Changes in employment are in comparison to current management as reflected in Alternative 2.

Table 3-19.
Estimated Changes in Employment (in Jobs) as Result of Forest Management

	Alternative													
Type of Employment	2[1]	3	4	5	6	7	8	8A	9	10	11	12	13	14
Timber-Related	0	-246	+11	+194	-246	+93	-71	-33	-195	-147	-109	+44	-148	-20
Recreation-Related	0	-108	-7	-11	+14	+14	+14	+14	-94	+14	+14	+14	-48	0
Wildlife-Related	0	-92	-130	+79	+68	+123	+24	+61	-76	-42	+4	+113	-38	+52
U.S Forest Service	0	-120	+52	+31	+15	+109	+33	+38	-20	-22	+67	+21	-11	+69
TOTAL ECONOMY	0	-566	-74	+293	-149	+339	0	+80	-385	-197	-24	+192	-245	+101

[1]Basis for comparison

Income

Based on 1985 information, $5,723,492,000 of total income is generated annually in the Forest impact area. Broken down by major industrial sectors, percentage of total income is (the Manufacturing sector includes the timber industry):

Major Sector	Percentage of Total Income
Agriculture, Forestry & Fisheries	2.78
Mining	1.58
Construction	8.42
Manufacturing	27.95
Transportation, Communications & Utilities	11.06
Wholesale & Retail Sales	9.88
Finance, Insurance & Real Estate	5.74
Services	17.08
Government Enterprises	0.79
Special Industries	14.74

Table 3-20 displays the changes in average annual income that could occur as a result of the management practices and policies contained in **the alternatives.**

Table 3-20.
Estimated Changes in Average Annual Income

Alternative	Millions of Dollars
2	0
3	-11.4
4	-1.8
5	+5.6
6	-1.8
7	+7.4
8	+0 5
8A	+2.1
9	-7.4
10	-3.7
11	+0 2
12	+4.2
13	-4.6
14	+2.6

Money Returned to Counties

Counties containing portions of the Forest receive payments from the Forest Service 25 Percent Fund and from the Bureau of Land Management Payment in Lieu of Taxes (PILT) fund

Twenty-five percent of all receipts collected for the use of Forest land is distributed to counties that contain Forest land. The funds are earmarked for roads and schools. A county's share of the 25 Percent Fund must equal at least 75 cents per acre of land involved. If it does not, the difference is paid to the state for distribution to the counties from Bureau of Land Management PILT funds.

From 1979 through 1990, the 13 counties in Virginia containing Forest land have received the payments shown in Table 3-21. These figures also include 25 Percent Fund and PILT payments for those portions of the Jefferson National Forest in Bedford, Botetourt, and Rockbridge counties in Virginia, and in Monroe County, West Virginia, and portions of the Monogahela National Forest in Pendleton County, West Virginia.

Table 3-21.
Money Returned to Counties

Year	25% Funds	PILT	Total
1979	152,178.54	786,955.00	939,133 54
1980	177,145 83	853,749.00	1,030,894.80
1981	286,780.28	841,069.00	1,127,849 20
1982	351,423.26	756,184.00	1,107,607 20
1983	368,537.46	670,311.00	1,038,848 40
1984	298,868 66	753,211 00	1,052,079.60
1985	338,251.30	691,564 00	1,029,815.30
1986	313,382.35	677,153.00	990,535 35
1987	288,339 65	635,991 00	924,330.65
1988	249,092.71	669,331.00	918,423 71
1989	287,016.88	680,664.00	967,680.88
1990	254,684 49	731,604 00	989,288.49

Table 3-22 displays the estimated 25 Percent Fund as a result of the management practices and policies contained in **the alternatives**

Table 3-22.
Estimated 25 Percent Fund by Alternative

Alternative	Thousands of Dollars
2	479
3	66
4	342
5	539
6	66
7	425
8	253
8A	294
9	113
10	170
11	205
12	375
13	170
14	309

This particular indicator needs to be balanced against the PILT funds that counties in Virginia and West Virginia receive for national forest acreage. Any differences in 25% Funds would be supplemented by PILT funds, up to a total of 75 cents per acre.

SOILS

Soils on the Forest are derived from two geographical provinces, the Blue Ridge and the Appalachian Valley and Ridge.

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

The other five ranger districts are located in the Appalachian Valley and Ridge Province and contain soils that developed from sedimentary rock such as shale and sandstone. Soils developed from sedimentary rock are moderately deep to shallow, less than 20 inches to bedrock. These soils have a slight-to-moderate erosion potential due to the common occurrence of greater than 35 percent rock fragments. North and west slopes are moderately productive. Southeast and southwest slopes are moderate-to-low in productivity.

Many lower slope positions in the Valley and Ridge Province contain a fragipan (restrictive layer) 2 feet to 3 feet beneath the surface. The fragipan restricts the downward movement of water and causes a perched water table that produces very wet conditions during periods of high rainfall.

Available research indicates that productivity is sustained through nitrogen and carbon fixation, mineral release from weathering parent material, decaying vegetation, and translocation of nutrients.

The Forest has a backlog of an estimated 196 acres of watershed improvement needs such as abandoned roads, trails, mines, gullies, and eroded streambanks. This number will vary from year to year as areas are treated and new areas are identified.

Three major factors affect soil productivity on the Forest: erosion, compaction, and nutrient loss and cycling.

Effects of the Alternatives

Soil Erosion. Table 3-23 displays for each alternative the anticipated accelerated soil erosion (erosion caused by human activities). **Alternative 3** creates the least amount of soil erosion. In a few locations, erosion from natural causes (landslides, etc.) is greater in **Alternative 3**, since watershed improvement projects are not undertaken in response to natural processes. The overall effect, however, is reduced erosion, since many system roads are closed and timber harvesting and other soil-disturbing activities are eliminated or greatly restricted.

Alternative 7 causes the most erosion because of a high level of timber harvest and associated road construction.

Table 3-23.
Accelerated Soil Erosion (Human-Caused)

Alternative	Average Annual Erosion (Thousands of Tons) in First Decade
2	10.6
3	2.6
4	14.6
5	14.9
6	4.6
7	15.0
8	9.4
8A	10.6
9	5 5
10	7.0
11	8.5
12	13.2
13	7.9
14	10.5

Compaction. Due to the inherent soil characteristics that occur on the Forest and the standards applied to forest management activities, in **no alternative** does soil compaction result in long-term reductions in soil productivity. Most soils on the Forest have low clay content in the surface layer and stony conditions that reduce cohesion and thus do not have severe compaction hazards. Ripping or discing and revegetating are required for compacted travelways (e.g., skid trails, temporary roads, and log landings) in timber sales (process paper *Incorporation of the NFMA Requirements for Conserving Soil and Water Resources and Not Allowing Significant or Permanent Impairment of the Productivity of the Land into the Revision of the Forest Plan*).

Nutrient Loss/Cycling. In **no alternative** is nutrient loss or nutrient cycle disruption severe enough to lower productivity over the short or long term. Conventional timber harvesting will remove from the site some nutrients in the main stem, and the nutrient cycle will be temporarily affected, but the disruption and removal is not significant enough to lower productivity. Research on a variety of sites in central and southern Appalachian forests has shown that increases in dissolved nutrient losses are negligible with respect to site nutrition following clearcutting and sawlog harvest (Aubertin and Patric, 1974; Swank, 1985). Research indicates that most temperate forest soils will recover from timber harvests by nutrient replacements through mineral weathering and natural inputs (Pritchett, 1979). Annual nutrient additions in precipitation can replenish nutrient removals associated with timber harvest over a normal rotation period (Swank, 1984). **No alternatives** involve intensive timber harvest practices, such as whole-tree harvesting or short rotations, which could impair productivity through nutrient losses.

Suitability

As displayed in Appendix A of the Revised Plan, more than 85 percent of the Forest is "tentatively suitable" for timber production. Table 3-24 displays the acreage suitable for timber production for the fourteen alternatives considered in detail and the maximum timber benchmark.

Table 3-24.
Lands Suitable For Timber Production.

Alternative	Thousands of Suitable Acres
Maximum Timber Benchmark	915
2	300
3	0
4	354
5	655
6	0
7	696
8	260
8A	350
9	66
10	120
11	280
12	595
13	185
14	350

None of the alternatives utilize more than 75 percent of the lands tentatively suitable for timber production (the suitable lands in the maximum timber benchmark). Alternative 7 contains the most lands suitable for timber production. Suitable acres vary between 0 and 696,000 acres. Potential alternatives with larger amounts of lands suitable for timber production must include less productive sites (predominately hardwood stands on site index 40 and southern yellow pine stands) in their suitable lands and would be economically inefficient.

Allowable Sale Quantity

Table 3-25 displays the allowable sale quantity (ASQ) for the fourteen alternatives considered in detail in the FEIS. ASQ is the maximum amount of timber that can be harvested on lands suitable for timber production during the first decade of implementing any alternative. The Forest could offer varying amounts of timber every year under any alternative as long as the total amount of timber off lands suitable for timber production for ten years did not exceed the ASQ.

Table 3-25.
Allowable Sale Quantity for All Products.

Alternative	MMCF	MMBF
Maximum Timber Benchmark	266	1,860
2	54	380
3	0	0
4	57	400
5	97	680
6	0	0
7	74	520
8	39	270
8A	47	330
9	11	80
10	21	150
11	30	210
12	64	450
13	21	150
14	50	350

These alternatives have ASQs ranging from 0 to 680 MMBF. The ASQ in Alternative 5 is 150 percent of anticipated demand and considered the maximum amount that the Forest could practically offer with a reasonable likelihood of selling.

Table 3-26 displays a breakdown of the ASQ by estimated amount of hardwood sawtimber, softwood sawtimber, hardwood poletimber and softwood poletimber for the fourteen alternatives considered in detail in the FEIS.

Table 3-26.
Allowable Sale Quantity (in Millions of Board Feet) by Product

Alternative	Hardwood Sawtimber	Softwood Sawtimber	Hardwood Poletimber[1]	Softwood Poletimber
2	10.5	0.2	27.0	0 3
3	0	0	0	0
4	11.0	0	29 0	0
5	19.0	0	49 0	0
6	0	0	0	0
7	13.0	1 6	34.8	2.6
8	7.5	0.1	19.2	0.2
8A	9 1	0.1	23.7	0.1
9	1.2	0 9	3.5	2.4
10	4 4	0	10.6	0
11	4.3	1.7	12 4	2 6
12	11.4	1.2	30 7	1.7
13	4.1	0.2	10.5	0.2
14	9.8	0	25.2	0

[1]Includes fuelwood.

Demand

Demand for forest products is expected to grow for the next 30 years The Forest offers a variety of forest products including hardwood and pine sawtimber, hardwood and pine pole timber, fuelwood, and other products. No towns or communities are entirely dependent on the Forest for their livelihood. However, a number of families derive at least a part of their income by harvesting forest products from the Forest. (See the discussion in Appendix B.) Table 3-27 displays the anticipated demand for Forest timber. The derivation of the demand for timber products is also discussed in Appendix B.

Table 3-27.
Anticipated Demand for Timber from the Forest

Year	Million Cubic Feet/Year	Million Board Feet/Year
Current (1989)	5.4	38.0
2000	6.5	45.5

Supply and Demand Comparisons

Table 3-28 displays the allowable sale quantity as a percentage of the anticipated demand for timber for each of the fourteen alternatives considered in detail in the FEIS.

Table 3-28.
Supply (as a percent of demand[1]) of Timber Products

Alternative	Percentage
2	83%
3	0%
4	88%
5	149%
6	0%
7	114%
8	59%
8A	74%
9	20%
10	33%
11	46%
12	99%
13	33%
14	77%

[1]Demand is equal to 455 MMBF for the first decade of the Revised Plan.

As displayed in Table 3-28, Alternatives 5, 7 and 12 meet or exceed the estimated demand for timber products from the Forest The remaining alternatives meet between 0 and 88 percent of the estimated demand for timber products.

Timber Harvest Methods

Under the latest interpretations of NFMA and NEPA, any decisions on even-aged or uneven-aged timber harvest methods must be based on site-specific analysis during implementation. Any alternative can, however, limit or eliminate the use of timber harvest methods that do not achieve the objectives of the management areas in any alternative or the desired future condition of the entire alternative.

The fourteen alternatives explore the use of a wide range of timber harvest methods to meet a variety of desired future conditions Alternatives 3 and 6 designate no lands as suitable for timber production and hence employ no even-aged or uneven-aged timber harvest methods. Alternative 9 only employs uneven-aged timber harvest methods. Alternative 13 limits even-aged timber harvest methods to two-stage shelterwood. Alternative 11 limits even-aged timber harvest methods to modified shelterwood and two-staged shelterwood The other alternatives explore different mixtures of even-aged and uneven-aged timber harvest methods. Both Alternatives 8 and 8A restrict clearcutting to specific instances or management areas.

Table 3-29 displays the average annual acreage treated for even-aged and uneven-aged timber harvest methods. For even-aged timber harvest methods, the numbers displayed are the acres of openings created For uneven-aged timber harvest methods, the numbers displayed reflect the acres dedicated to uneven-aged management. Acres of "openings" have little meaning and poorly reflect the amount of disturbance caused by uneven-aged timber harvest methods.

Table 3-29.
Thousands of Acres of Timber Harvesting by Methods During the First Decade

	Alternative													
Timber Harvest Method	2	3	4	5	6	7	8	8A	9	10	11	12	13	14
Even-aged Methods														
Clearcutting	15	–	10	40	–	20	3	3	–	9	–	12	–	10
Seed Tree	2	–	–	–	–	2	2	2	–	–	–	–	–	2
Removal	2	–	–	–	–	2	2	2	–	–	–	–	–	2
Modified Shelterwood	4	–	18	–	–	–	10	16	–	–	8	14	–	8
Two-Stage Shelterwood	*	–	–	–	–	14	–	–	–	–	–	7	11	–
TOTAL Even-aged Methods	23	0	28	40	0	38	17	23	0	9	8	33	11	22
Uneven-aged Methods **														
Group Selection	9	–	–	–	–	32	16	8	50	–	82	–	31	47
Individual Tree Selection	–	–	–	–	–	–	–	–	6	–	4	–	–	–
TOTAL Uneven-aged Methods	9	0	0	0	0	32	16	8	56	0	86	0	31	47

*Less than 500 acres, rounded to 0
**These are the acres where uneven-aged treatments will be employed, not the acres of openings created

VEGETATION

The Forest is part of the Appalachian Hardwood Forest within the Eastern Deciduous Forest Province There are over 40 tree species represented and over 2,000 species of shrubs and herbaceous plants. Hardwood-dominated forest types comprise approximately 80 percent of the acreage and conifers comprise about 20 percent.

Oak component high on Forest

To broadly describe the vegetation, the Forest is divided into four forest type-groups representing the Mixed Oak Forest of the Appalachian Hardwood Sub-region (Barrett, 1980). They are: chestnut oak-scarlet oak; white oak-black oak; red oak-red maple; yellow poplar-mixed hardwood (see Table 3-30).

These four type-groups provide a general grouping of the physical and biological factors related to site productivity and soil moisture regime. Chestnut oak-scarlet oak is the least productive and driest group and yellow poplar-mixed hardwoods the most productive and moist.

Practically all 1.1 million acres of the present vegetation experienced drastic disturbance in the past from two events: (1) uncontrolled logging and burning between 1885 and 1925 (Satterthwaite, 1991), (2) disease infestation by the chestnut blight, *Endothia parasitica*, which peaked about 1920 (McCormick and Pratt, 1980). To put these disturbances in perspective, only about 158,000 acres[1] of vegetation (15 percent of the Forest) has been disturbed by timber harvests under Forest Service jurisdiction during a 77 year period from 1914 to 1990.

Regeneration of the Forest, after logging disturbance to the vegetation and the natural replacement of chestnut, has occurred in two ways: (1) co-dominant species already present in the overstory filled in the available space and (2) more complex changes occurred, resulting in the emergence of species not previously important in the overstory (Stephenson, 1986).

There is much variation in the vegetation and many natural changes are taking place as forest succession progresses. Some relatively stable or climax forest conditions remain on the Forest but most have not had time to develop.

The Forest vegetation is again facing a major disturbance -- gypsy moth. Over 250,000 acres have received defoliation and some mortality since 1986. The entire Forest is expected to be affected within the next five to seven years.

[1] From Forest cut records. 1,558 MMBF, 1914-1990, at 10 MBF per acre.

Table 3-30.
Current Diversity of Forest Types on the George Washington National Forest

Moisture Regime	Dry			Moist		
Forest Type Group[2]	Chestnut Oak - Scarlet Oak White Oak - Black Oak	312,000 Acres 440,000 Acres		Red Oak - Red Maple Yellow Poplar - Mixed Hardwoods	101,000 Acres 173,000 Acres	
Forest Types[3]		M Acres	%		M Acres	%
	Red Oak, White Oak, Hickory	167.0[4]	23	White Oak, Red Oak, Hickory	167.0[4]	54
	White Oak	7.2	1	Yellow Poplar, Red Oak, White Oak	40.0	13
	Chestnut Oak	221.0	30	Northern Red Oak	15 3	5
	Scarlet Oak	43.5	6	Sugar Maple, Beech, Yellow Birch	9.4	3
	Chestnut Oak, Scarlet Oak	61.5	8	Yellow Poplar	4.2	1
	Brush Species	2.0	<1	Upland Hardwood, White Pine	16.3	5
	Upland Hardwood, Yellow Pine	107.1	15	Cove Hardwood, White Pine	6 2	2
	Yellow Pine, Oak	6.8	9	White Pine, Hardwood	12.4	4
	Yellow Pine	59.0	8	Hemlock, Hardwood	5.8	2
				White Pine	22.8	7
				White Pine, Hemlock	2.3	<1
				Hemlock	1.2	1
Totals		735.1[5]	100		302.9[5]	100

[2]Acres based on site index from Continuous Inventory of Stand Conditions II See process paper *Allocation of Acres to Type Groups.*
[3]Acres from Report CPO#3, Acres by Forest Type and Stand Condition Class dated January 8, 1991.
[4]Divided equally between dry and moist.
[5]Difference from Forest total is uninventoried, non-forest, and water.

In the following descriptions of the four forest type-groups, associated forest cover-types are listed with their corresponding Society of American Foresters (SAF) type numbers. A full description of each forest cover-type can be found in *Forest Cover Types of the United States and Canada*, F H. Eyre, Editor. SAF 1980

The direct and indirect effects on Forest vegetation that are the consequences of implementing each of the alternatives are discussed for each type-group. An important factor in describing the effects on vegetation is the role of succession in the ecological process. Although certain aspects of the process can be identified, the consequences of their occurrence may not be similar on different sites or at different times. The assessment of environmental impacts, whether natural or human-caused, upon forest ecosystems "may be more complicated than we can think." (McCormick and Platt, 1980).

When vegetation is disturbed, there are three characteristic responses to the changes, according to Woods and Shanks, 1959:
(1) accelerated growth of canopy trees and partial closure of the canopy
(2) accelerated growth of seedlings and saplings in the exposed understory
(3) invasion of new species better adapted to the new microenvironment (McCormick and Platt, 1980).

The disclosure of direct and indirect effects relates to the following issues:
(1) diversity of vegetation
(2) resource sustainability
(3) vegetation manipulation

Chestnut Oak-Scarlet Oak Type-Group

The chestnut oak-scarlet oak group is generally found on shallow, sandy, or gravelly dry soils; steep slopes, ridge-tops or noses, and south to west aspects. The oak site index is 50 or less.

Associated forest cover-types are: bear oak (SAF 43), chestnut oak (SAF 44), black oak (SAF 110), pitch pine (SAF 45); white pine-chestnut oak (SAF 51); Virginia pine (SAF 79); and Virginia pine-oak (SAF 78).

The understory vegetation of this group is unique for the dominance of shrubby plants of the heath family (*Ericaceae*). Most noticeable is mountain laurel. Others include several blueberries (*Vaccinium*, sp) and huckleberry (*Gaylussacia*, sp) species. Dwarf chinkapin oak,bear oak and blackberries also occur. Often seedlings of overstory or mid-story trees occupy open spaces in the understory. Chestnut oak seedlings are often abundant while scarlet oak, black oak, sassafras, black gum, red maple and yellow pine seedlings are scarce Various herbs and ferns can be found on these sites, but total numbers are low.

The pine found in these stands indicates previous disturbances by either fire, land-clearing, or timber cutting. Sites with the most severe or repeated disturbances, whether natural or man-made, are likely to be composed entirely of pine. Pine may also be intermingled with hardwood species. The mixture of natural events with the accidental and intentional actions of man have created sufficient disturbance to intersperse pine forest types throughout the Appalachian Hardwood Forest.

Effects of Alternative 3

Alternative 3 does not call for management by vegetation manipulation. Therefore, impacts are indirect and take place over long periods of time as vegetation responds to natural disturbances. Prescribed burning does not occur in Alternative 3.

Effects of Alternatives 2, 3, 4, 9, 10, 11, 13

Alternatives 2, 4, 6, 9, 10, 11, 13 do not allocate timber harvest to the chestnut oak-scarlet oak type-group. Prescribed burning does occur in **Alternatives 2, 4, 6, 9, 10, 11, 13.**

Diversity of Vegetation in Alternatives 2, 3, 4, 6, 9, 10, 11, 13. The variety of overstory and understory plants presently existing in stands of the chestnut oak-scarlet oak type-group could decline over time as forest succession follows its expected course. Exceptions would occur where frequent prescribed burning or wildfires occur.

Chestnut oak could become more dominate as the single major overstory species Several yellow pine species could decline significantly, except on the most severely dry and rocky sites already occupied only by table mountain pine. Bear oak barrens could disappear as tree species invade them and less frequent fires no longer initiate the regeneration process. Yellow pine and bear oak could be maintained in areas where prescribed burning or wildfires occur.

Forest succession will favor the eventual dominance of chestnut oak on most sites in this type group. Chestnut oak is intermediate in understory tolerance, while the other prevalent tree species in this type group, except black oak and eastern white pine, are intolerant. This difference in tolerance allows chestnut oak seedlings to germinate and survive while seed of the more intolerant species does not germinate and survive as well. Chestnut oak seedlings survive with repeated die-back and resprouting, to eventually be released for full growth when small openings appear in the canopy after individual or small groups of trees die. Chestnut oak seedlings quickly develop a deep tap root, like most other oaks, but they maintain much higher root-starch levels during the growing season. A higher root-to-shoot ratio may partly account for the adaptability to dry sites (Farmer, 1978).

Scarlet oak has dominated dry sites because of its rapid growth and drought resistance. Because it is one of the most intolerant of the oaks, it rarely is found

in an intermediate or suppressed position (Campbell, 1965). Faced with less disturbance and the competition with chestnut oak, scarlet oak will eventually loose its dominance to chestnut oak. On dry sites without chestnut oak present, scarlet oak becomes a relatively stable component of forest vegetation if small openings appear after individual or small groups of trees die.

Seed of the four yellow pine species requires exposed mineral soil and full sunlight that occurs after clearcut and seed tree logging or fire. Without logging disturbances, preventing a decline of yellow pine species will depend on natural occurrences of exposed mineral soil and a sparse understory. Wildfire and prescribed burning can create conditions favorable for regeneration.

The understory vegetation which is dominated by plants of the heath family could change dramatically as disturbances (mainly fire) become less frequent

Without frequent fires, disturbance-dependent vegetation types will be less diverse. Pitch pine, scarlet oak, and chestnut oak will overtop and replace bear oak in stands without frequent fires. Bear oak is an associated species restricted to poor, dry sites which have been disturbed frequently by fire. Soils are usually very thin, rocky, strongly acid, and low in nutrients. Bear oak usually occurs as a shrub or small tree in scattered clumps where other oaks or pines are at least twice as tall. When in pure stands, bear oak areas are often called barrens (Eyre, 1980). Diversity for the above sites can be maintained where prescribed burning occurs.

On these dry sites of the chestnut oak-scarlet oak type-group, shrubs dominate the understory and the herbaceous layer is sparse. Many of the shrubs such as blueberries and huckleberries are present due to a fire history. If a more closed canopy develops from the dominance of chestnut oak in the overstory and fires are less frequent, herbaceous plants may become more prevalent and shrubs less abundant.

Old growth characteristics (large tree size, vertical stand structure, increased species diversity) could develop in this type group due to frequent low intensity disturbance over long time periods. These forests will have less species diversity than other forest type-groups. Some stable plant communities could develop in stands of chestnut oak or table mountain pine.

In the absence of disturbances that would perpetuate pitch pine and other associates such as Virginia pine and shortleaf pine, pines are replaced by hardwood species (Little, 1959). Table mountain pine would continue to exist on only the extremely dry and nutrient-poor rock outcrops and steep shale slopes, even without fire disturbance (Zobel, 1969). Prescribed burning will aid in maintaining these species since it duplicates the natural processes under which these communities evolved.

Where fires do occur, pitch pine may survive quite well because its thick bark provides protection. Even trees that are defoliated by fire are often able to resprout along the bole (trunk) and continue to live (Little, 1959)

Resource Sustainability In Alternatives 2, 3, 4, 6, 9, 10, 11, 13. Oaks could be replaced by red maple, black gum, black locust, sassafras and some yellow pines as a result of gypsy moth and oak decline/wilt impacts.

Defoliation by gypsy moth in conjunction with oak decline or oak wilt could have significant impacts on this type-group. Chestnut oak is a favorite species of the moth (Gansner and Herrick, 1985). The deeply furrowed bark offers ideal protection for egg masses. Scarlet oak succumbs quickly to mortality after one or two defoliations. Heavy mortality to chestnut and scarlet oak from gypsy moth defoliation and oak decline would leave less susceptible species such as red maple, black gum, black locust, and sassafras a greater opportunity to occupy the overstory. Other species, primarily chestnut oak on these sites, took over the position occupied by American chestnut as a result of the disturbance caused by the chestnut blight (Stephenson, 1986).

Removal of chestnut oak and scarlet oak as a major component of the overstory -- as has occurred in the areas of gypsy moth defoliation -- results in a short term flush of herbaceous plant growth such as sow thistle, pokeberry and white snake root where a shrub understory is sparse. Where a shrub understory such as blueberry and laurel exists, growth rapidly increases, shading the forest floor and reducing the opportunity for herbaceous species.

Understory vegetation could experience drastic, rapid changes in herbaceous and shrub growth and species composition whenever the overstory is severely disturbed.

The amount of various successional stages of vegetation due to fire disturbance could be more than in other alternatives if prescribed burning occurs predominately in this type group

When site index is equal, scarlet oak tends to be better represented in forests with a fire history than in forests with little or no evidence of past burning. Scarlet oak is often prevalent in areas with a fire history, probably because of its vigorous sprouting ability after burning and the elimination of more fire-sensitive competitors (Berry et al 1978). Fire suppression activity on national forest land greatly reduces fire-induced natural regeneration of scarlet oak from stump and root sprouts

In **Alternative 3**, larger but less frequent wildfires are anticipated in the more remote parts of the Forest The effect on vegetation is a change in the current mosaic of successional stages and species such as yellow pine that are pro-

duced by more numerous fires. If the interval between fires is long enough, yellow pines that are already 70 years to 80 years old will die before being able to regenerate.

Vegetation Manipulation in Alternatives 2, 3, 4, 6, 9, 10, 11, 13. Clearcutting is not allowed. However, some catastrophic disturbances -- if they occur -- will have impacts similar to clearcutting on overstory and understory vegetation. Secondary succession will take place in these instances. Prescribed burning rarely affects overstory trees and has its greatest impact on understory vegetation only. There is usually a flush of sprout growth and an influx of new species in the understory vegetation following prescribed burning.

Effects of Alternatives 5, 7, 8, 8A, 12, 14

The cutting practices and site preparation provided in **Alternatives 5, 7, 8, 8A, 12, 14**, impact suitable land only. Prescribed burning impacts vegetation on both suitable and unsuitable land There will be short-term direct effects on vegetation and long-term indirect effects as species compete to occupy space made available in the understory or overstory. Vegetation on forest land classified as unsuitable will be affected as described for **Alternative 3**, except for areas where prescribed burning occurs.

Diversity of Vegetation in Alternatives 5, 7, 8, 8A, 12, 14.
See White Oak-Black Oak.

Resource Sustainability in Alternatives 5, 7, 8, 8A, 12, 14.
See White Oak-Black Oak.

Vegetation Manipulation in Alternatives 5, 7, 8, 8A, 12, 14. The impacts on vegetation will be similar to those described in the white oak - black oak type group for **Alternatives 2, 4, 5, 7, 8, 8A, 14.** Clearcutting will be the predominate cutting method used in the chestnut oak - scarlet oak type group in **Alternatives 5, 7, 14.**

White Oak-Black Oak Type-Group

The white oak-black oak group of the Appalachian Hardwood forest is generally found on a wide range of soil types, usually moderately deep; a wide range of slopes, including valleys and ridge-tops; and all types of terrain. The oak site index is 51 to 65.

Prevalent tree species are: white oak-black oak-northern red oak (SAF 52); chestnut oak (SAF 44); white oak (SAF 53); black oak (SAF 110); northern red oak (SAF 55); white pine-chestnut oak (SAF 51); eastern white pine (SAF 21); pitch pine (SAF 45); Virginia pine (SAF 79); and Virginia pine-oak (SAF 78).

The understory vegetation is variable. On dry sites, blueberries, huckleberries and mountain laurel abound. On more moist sites, sourwood, serviceberry,

dogwood, wild grape, greenbrier, rhododendron, Virginia creeper and poison ivy are found. The number of individual occurrences of these plants is often sparse.

The presence of pine in this group also indicates past disturbances, usually wildfire associated with the original logging activity. Land-clearing may have played a role in the Piedmont areas of southeast parts of the Pedlar District. White pine, which occurs more frequently here than in the previous group, may be an exception.

White pine is close to the oaks in ability to tolerate shade. It is not as long-lived, but does grow faster once exposed to full sunlight (Stiell, 1985). Eventually, oaks and hickories replace white pine if no natural or man-caused disturbances intercede. White pine seedlings persist in the understory and can establish in natural openings created by wind or ice storms or insect and disease attack.

Large areas of the Forest are comprised of the white oak-black oak group. Oak seedlings are tolerant enough to become established in the understory. However, large populations of deer in many areas of the Forest heavily browse oak seedlings and shrubs. Oak seedlings and sprouts are a preferred browse species of deer. Heavy deer browsing in an area can severely reduce advance reproduction of oaks and other species.

Effects of Alternatives 3, 6, 10

Alternative 3 does not include vegetation disturbance management techniques. Therefore, impacts will be indirect and take place over long periods of time as vegetation responds to natural disturbances. Prescribed burning does not occur in **Alternative 3.**

Alternatives 6 and 10 do not allocate timber harvest to the white oak-black oak type-group, so effects will be similar to those for **Alternative 3. Alternatives 6 and 10** allow prescribed burning, so understory vegetation will be affected.

Diversity of Vegetation in Alternatives 3, 6, 10. *The variety of overstory trees* presently existing in the white oak-black oak type-group could decline over time as forest succession follows the course expected with no disturbances from timber harvests.

On most sites, succession will favor the eventual dominance of white oak in this type-group. White oak usually becomes dominant because it persists for long periods of time in the understory (most tolerant in its youth), it responds well after release, and lives up to 600 years. On moderately dry sites, it can become a relatively stable component of forest vegetation (Eyre, 1980).

Even though white oak acorns may produce fewer seedlings than other oaks in a given year, those seedlings can persist in the understory for many years

by repeatedly dying back and resprouting. Gradually there is a build-up of advance reproduction that is taller and more numerous than that of other oaks (Rogers, 1990). White oak, then, has a better chance to grow into the overstory position when openings are created by ice or wind-throw or insect/disease mortality to individual trees or to small groups of trees.

White oak seedlings produce a conspicuous, well-developed taproot (Brown and Woods, 1968). Soil moisture is probably not a critical factor in determining early seedling survival, except under unusually dry conditions (Minckler, 1965).

White oak is less susceptible to oak wilt than black oak (Hepting, 1971) and, therefore, is more likely to dominate where oak wilt is present.

Black oak is intermediate in tolerance to shade and is less tolerant than white oak and chestnut oak. Seedlings usually die within a few years after being established under fully stocked overstories When an opening in the overstory provides more abundant sunlight, only the larger stems of advance reproduction are capable of competing to the extent of reaching the intermediate crown class and rarely dominate the site when other oaks are present (Brinkman, 1965). Black oak is a moderately long-lived tree, usually maturing at about age 100 and rarely living more than 150 years to 200 years (Brinkman, 1965).

Black oak is a persistent seed producer. Seedlings develop a primary root quickly after germination and can survive droughty conditions (Sander, 1979). They have about the same tolerance to drought as white oak seedlings (Seidel, 1972). Light intensity appears to be critical to the survival and growth of black oak seedlings (Sander, 1979). Oak wilt is a potentially serious vascular disease of black oak and trees die within a few weeks after symptoms appear (Hepting, 1971).

White oak could become more dominant as the single major overstory species The small pine component (yellow and white pine) is more likely to decline in comparison to other alternatives that allow harvesting, except in alternatives allowing prescribed burning or where wildfires occur. Understory species would not vary much except where the pine overstory is replaced by oaks. Hack and Goodlett (1960) showed distinct differences in understory vegetation among pine and hardwood stands in a portion of the Ridge and Valley area of the Forest.

The better sites of this white oak-black oak type-group are less likely to provide conditions favorable for establishing and growing yellow pine species than the chestnut oak-scarlet oak type-group. The more abundant shrub and herbaceous layer of vegetation reduces the chance for areas of exposed mineral soil favorable for pine regeneration. Unless existing stands with a component of

yellow pine experience wildfire or prescribed burning in **Alternative 10**, the pines are not able to regenerate and hardwoods eventually dominate.

On the more varied and better quality sites in this type-group, there are numerous species of shrubs, herbs, and ferns. If white oak (including chestnut oak) becomes more prevalent in the overstory, the overall diversity of understory plants should remain similar because small openings in the overstory due to mortality and microsite conditions would not differ greatly from existing conditions.

On the sites of this type, old growth characteristics will develop which will be consistent with forests that have frequent, low intensity, widespread disturbance episodes.

Without planting or some disturbance to expose mineral soil, white pine would gradually decline as a species in this type-group except on poorer sites where it may become stable with chestnut oak.

Resource Sustainability in Alternatives 3, 6, 10. When conditions that provide for adequate regeneration of oak are eliminated, oak could be replaced in the overstory by blackgum, locust, red maple, white pine, and some yellow pine as a result of gypsy moth and oak decline impacts.

In **Alternative 3**, larger but less frequent wildfires are anticipated in the more remote parts of the Forest. The effect on vegetation will be a reduction of the current mosaic of successional stages and forest types produced by more numerous fires.

Defoliation by gypsy moth in conjunction with oak decline and oak wilt could have significant impacts on this type-group. Kegg (1973) reports that in New Jersey, mortality in black oak usually occurs after two or three defoliations White oak trees frequently die when there is interaction from defoliation followed by invasion of shoestring fungus and two-lined chestnut borer (Rogers, 1990). The eventual loss of much of the oak component from the overstory of this forest type would result in secondary succession involving species that are less susceptible to defoliation and other diseases, that are now present in the understory, or new species that are able to become established. Blackgum, locust, red maple, white pine, and yellow pine could become more prevalent. The relative abundance of each would depend on variations in site conditions, aspect, and defoliation experienced.

White pine presently in stands as overstory and/or understory trees is capable of regenerating itself in disturbed areas. White pine saplings respond rapidly when released. White pine is less favored by gypsy moth than oaks (Gansner and Herrick, 1985). It is only eaten by the latter stages of the gypsy moth larva

and then only on understory seedlings and saplings when more favored species are no longer available. Early stages of the larva can't sustain themselves on white pine needles alone (Brown et al, 1988).

White pine weevil damage would not be significant in the shaded understory Occurrence of white pine blister rust was virtually eliminated as a threat to white pine during the gooseberry (*Ribes* spp) eradication efforts in the 1950s.

Vegetation Manipulation in Alternatives 3, 6, 10. Clearcutting is not allowed However, some catastrophic disturbances, if they occur, will have impacts similar to clearcutting on overstory and understory vegetation Secondary succession will take place in these instances in a manner similar to the succession that follows clearcutting. However, the disturbance will be less than in alternatives that allow clearcutting

Effects of Alternatives 2, 4, 5, 7, 8, 8A, 9, 11, 12, 13, 14

The cutting practices and site preparation provided in **Alternatives 2, 8, 8A, 12, 13, 14** impact suitable land only. Prescribed burning also impacts vegetation on unsuitable land. There will be short term direct effects on vegetation and long term indirect effects as species compete to occupy the space made available in the overstory or understory. Vegetation on unsuitable forest land of this type-group will be affected as described for **Alternative 3**, except areas where prescribed burning occurs.

Alternatives 4, 5,and 7 provide for vegetation manipulation on suitable land by the use of clearcutting. The impacts on vegetation will be similar to those described for clearcutting, as follows. Vegetation on unsuitable forest land of this type-group will be affected as described for **Alternative 3**, except for areas where prescribed burning occurs.

Alternative 9 provides for vegetation manipulation on suitable land using only the uneven-aged management methods of group selection or individual tree selection.

Diversity of Vegetation in Alternatives 2, 4, 5, 7, 8, 8A, 9, 11, 12, 13, 14. The disturbances created by cutting practices will affect species diversity in the overstory and understory across the Forest. Species diversity on the site will increase immediately following disturbance due to conditions favorable for early successional species. Given enough time, which will vary by vegetation type, species diversity will return to pre-disturbance numbers. The existing variety of forest types, age classes, and understory plant communities is present because of natural and man-caused disturbances in the past. These disturbances modify the process of forest succession. When cutting practices or prescribed burns are used, a mix of light intolerant and tolerant tree species of all ages is maintained throughout the Forest instead of a shift to more light tolerant species and a less broad mix of ages. The effects will vary among

alternatives relative to the total area of suitable acres, the allowable sale quantity (ASQ), and the amount of prescribed burning that occurs.

Planting white pine in stands that contain a component of white pine will help maintain the diversity this species provides in this type-group.

Resource Sustainability in Alternatives 2, 4, 5, 7, 8, 8A, 9, 11, 12, 13, 14. Using harvest methods such as clearcutting that establish large 30 acre to 40 acre stands of oak regeneration in advance of defoliation and mortality may help preserve the oak component of this type-group from loss to gypsy moth impacts (Gottshalk, 1989).

Shelterwood harvests would stress the remaining crop trees, increasing their risk to mortality from defoliation by gypsy moth larva or from oak decline. The development of advance reproduction could not proceed rapidly enough to become established before defoliation is expected to occur.

Group selection harvests would not establish large enough areas of regeneration to be unaffected by the gypsy moth defoliation.

Deer attracted to the fresh sprout growth in small, scattered, cut areas of the group selection method can easily overbrowse desirable regeneration. This interferes with the ability of oak to compete with other species.

Individual tree selection will not reproduce a new stand in which oak will dominate (Minckler, 1961). The more tolerant species, such as red maple, black gum and white pine will be favored (Trimble, 1973). If deer browsing is already moderate in the area, the few stump sprouts from the harvested trees will be heavily browsed.

Vegetation Manipulation in Alternatives 2, 4, 5, 7, 8, 8A, 9, 11, 12, 13, 14. Both even-aged and uneven-aged cutting methods can be used. Even-aged allows for clearcuts, modified shelterwood, shelterwood, and seed tree methods for regeneration. Uneven-aged allows for group selection or individual tree selection.

Prescribed burning consumes logging debris and slash in harvest areas in preparation for natural pine regeneration. Prescribed burning releases nutrients into the soil from the duff and leaf layer, shrubs, seedlings and herbs, and small understory trees.

Prescribed burning disturbs the understory, resulting in a rapid regrowth of shrubs, seedlings, and herbs. Often, previously unseen herbaceous plants temporarily invade the burned area from the soil seed bank.

Clearcutting removes merchantable trees and allows full sunlight to reach the forest floor. Several clearcuts not too widely dispersed can diffuse the severity of browsing by deer, allowing oak regeneration a chance to compete with other vegetation.

Clearcutting allows rapid sprout growth from bent or broken advance reproduction which is generally adequate on the sites typical of this type-group (Clark and Watt, 1971).

Trees will be removed and will be replaced by young sprouts from advance reproduction and stumps in generally the same species composition that existed in the previous overstory (Sander, 1979). On the low-to-moderate sites of this type-group, advance oak reproduction will be adequate (Clark, 1970) unless deer browsing has been sufficiently heavy to allow other species to overtop the oak sprouts.

Stump sprout capability is high, especially on the smaller diameter stumps prevalent on low-to-moderate sites (Campbell, 1965).

Modified shelterwood and shelterwood have similar effects on sprout and seedling growth. However, since fewer trees are cut than with clearcutting methods, there will be less stump sprouting Also, seedlings will be produced from seed sources of the uncut trees. If heavy deer browsing occurs, the less abundant oak regeneration can be overtopped by more vigorous species that are less favored by deer.

Height-growth of oak regeneration is less in group selection openings that are less than 1 acre in size (Timble, 1973)

Following harvests of pine or mixed pine-hardwood stands, prescribed burning could help maintain the yellow pine component by natural regeneration. The shrub and herbaceous vegetation would be temporarily removed by the burning, providing a better seed bed for pine seedling establishment

Red Oak-Red Maple Type-Group

The red oak - red maple group is generally found on soils which are deeper, richer, and more moist than the previous two groups; at mid-to-high elevations on moderate to steep slopes; in coves in heads of drainages; on northwest to northeast aspects. This type-group is common in the Alleghany Plateau, but because the Forest is located at the southern limits of this type-group, sugar maple, more often than not, is replaced by red maple. The oak site index is 66 to 80.

Associated forest cover-types are: sugar maple-beech-yellow birch (SAF 25), black cherry-maple (SAF 28), eastern white pine (SAF 21); white pine-northern

red oak-red maple (SAF 20); white pine-hemlock (SAF 22); white oak-black oak-northern red oak (SAF 52); northern red oak (SAF 55); white oak (SAF 53); black locust (SAF 50); eastern hemlock (SAF 23); sugar maple (SAF 27); and red maple (SAF 108). Black birch, although a minor component of this type-group, is important as an indicator of this group.

Understory vegetation of this group is diverse and abundant. The more typical small tree or shrub species are dogwood, spicebush, hawthorns, hop-hornbeam, serviceberry, striped maple, rhododendron, grape, and greenbrier. However, the dry-site species so common in two other type-groups are absent here

Herbaceous plants include wood nettle, Dutchman's pipe, several ferns, jewel-weed, and black cohosh.

Shade intolerant yellow pine seldom occurs in this type-group, but intermediately-tolerant white pine remains. It continues to compete well with the more shade tolerant and longer lived species because of the ability of the seedlings to establish and survive. Deer seldom browse natural white pine seedlings as much as they do hardwood seedlings, sprouts, and planted white pine seedlings.

Available moisture is the key in the establishment and maintenance of this type Total rainfall is a primary factor, but evaporation also plays a role. The cooler, more shaded slopes retain more of the rainfall they receive and provide the growing conditions required. A mid-elevation position also results in cooler temperatures and less evaporation.

Growth rates are fairly rapid and on the best sites there is a continuous ladder of vegetation from the understory, to the midstory, and into the overstory. The understory tolerance of many of the species helps to make this possible. Many of the species are long-lived and capable of attaining large sizes.

Effects of Alternatives 3 and 6

Alternative 3 does not use vegetation disturbance management techniques. Therefore, impacts are indirect and take place over long periods of time as vegetation responds to natural disturbances.

Alternative 6 does not allow timber harvests and has little, if any, prescribed burning. Therefore, impacts on vegetation are similar to those described for **Alternative 3**

Diversity of Vegetation in Alternative 3, 6. *The variety of overstory and understory* plants existing in the red oak-red maple type-group could change over time as forest succession with less disturbance follows the course expected. However, the change may not be as great as in the preceding type-groups.

Northern red oak lives for 200 years to 300 years and is less tolerant than red maple. Northern red oak seedlings are less tolerant of drought than white or black oak seedlings (Seidel, 1972) Red oak seedlings exhibit the typical oak seedling habit of shoot die-back and resprouting over several years. This advance reproduction is then capable of rapid growth if released. When in competition with sugar maple or red maple seedlings, development of sufficiently sized red oak advance reproduction is lacking. Undisturbed stands tend to develop greater proportions of species other than northern red oak (Eyre, 1980).

However, since chestnut was often a dominant or co-dominant part of this type-group, there was a significant disturbance when chestnut was eliminated by the blight. Forest succession over the past 50 years seems to favor the continued dominance of red oak on most sites in this group (Stephenson and Adams, 1989). Red maple is usually second in importance in both the overstory and understory of stands containing red oak.

Red maple is a short-to-medium lived tree, seldom living longer than 150 years. It is more shade tolerant than red oak, but less than sugar maple. The most significant characteristic of red maple is the ability of seedling roots to develop differently in response to various environments. Seedlings can survive in situations ranging from swamp to dry upland. This characteristic root system adaptability is maintained as the trees grow older (Walters and Yawney, 1990). Red maple is one of the most abundant and widespread trees in eastern North America (Hutnick and Yawney, 1961). It can thrive on a wider range of soil types, textures, moisture, pH, and elevation than probably any other forest species in North America (Stephenson, 1974). Red maple is widespread throughout the Forest.

White pine is found on either the more exposed drier sites or along stream corridors generally in association with hemlock White pine is intermediate in shade tolerance, but can germinate and survive in up to 80 percent shade. It can achieve maximum height-growth in as little as 45 percent full sunlight (Stiell, 1985) (Balmer and Williston, 1983). White pine is a long-lived tree that commonly reaches an age of 200 years and is capable of living 450 years.

The varied understory, herbaceous plants and ferns, and tolerant tree species should continue to maintain their presence, although changes could be abrupt within small microsites, from even minor disturbances in the overstory.

The herbaceous vegetation found in the understory of the red oak-red maple type-group is varied and abundant in numbers of species. Shrubs are less abundant and often replaced by small, shade tolerant trees such as dogwood and striped maple. All these plants are very sensitive to microclimate conditions, so even minor disturbances can have impacts. Severe insect defoliation

of the overstory usually results in more light, warmth, and moisture reaching the forest floor, leading to the potential for different understory plants.

This type-group will most likely develop old growth characteristics representative of forests with frequent, low intensity, local disturbance episodes.

Resource Sustainability in Alternative 3, 6. Oaks could be replaced almost entirely by tolerant maples as a result of severe defoliation by gypsy moth. This type would be less likely to experience severe defoliation because the number of desirable species is low. Oak decline is not evident on these sites.

Defoliation by gypsy moth has more effect on the northern red and other associated oaks. With a sufficient number of defoliations, the moth causes mortality in the oaks Observations on the Forest show mortality often occurs first and to more of the oaks on the better sites. Gypsy moths do defoliate maples, but prefer oaks (Gansner and Herrick, 1985). High moth populations are not as likely in this type-group as in types containing more oak species. Defoliation would accelerate the successional progression to dominance by this type of maple.

Understory species could be affected dramatically if heavy defoliation occurs. New species may invade as others depart.

Fire is less likely to affect this type group and will generally only affect the understory.

Fire would probably have little effect on this type-group, given its small overall size, its scattered occurrence, and fire suppression activity. Fires are usually less intense and control is easier on cooler, more moist north and east aspects where this type-group is found. Fires are likely to be small and disturbance to vegetation confined to the understory herbaceous and shrub plants.

Vegetation Manipulation in Alternative 3, 6. Clearcutting is not allowed. However, some catastrophic disturbances -- if they occur -- will have impacts similar to clearcutting on overstory and understory vegetation. Secondary succession will occur in these instances.

Effects of Alternatives 2, 4, 5, 7, 8, 8A, 9, 10, 11, 12, 13, 14

The cutting practices and site preparations in **Alternatives 2, 8, 8A, 10, 11, 12, 13, and 14** will have short term, direct effects on vegetation and long term indirect effects as species compete to occupy the space made available. Prescribed burning is not allowed on suitable land and is not anticipated to occur on unsuitable land.

Alternatives 4, 5, and 7 provide for vegetation manipulation on suitable land using clearcutting only. The impacts on vegetation will be similar to those described for clearcutting, as follows. Prescribed burning is not allowed on suitable land and is not anticipated to occur on unsuitable land.

Alternative 9 provides for vegetation manipulation on suitable land using the uneven-aged management methods of group selection and individual tree selection only.

Diversity of Vegetation in Alternatives 2, 4, 5, 7, 8, 8A, 9, 10, 11, 12, 13, 14. The disturbance created by cutting practices will effect species diversity in the overstory and understory. Species diversity on the site will increase immediately following disturbance due to conditions favorable for early successional species Eventually, species diversity will return to pre-disturbance numbers. The existing variety of forest types, age classes, and understory plant communities is present because of natural and man-caused disturbances in the past These disturbances modify the process of forest succession. With disturbances to the vegetation, a mix of light intolerant and tolerant species of all ages is maintained instead of a shift to mostly light tolerant species with a less broad mix of ages The effects will vary among alternatives relative to the total area of suitable acres and allowable sale quantity (ASQ)

Resource Sustainability in Alternatives 2, 4, 5, 7, 8, 8A, 9, 10, 11, 12, 13, 14. The impacts of gypsy moth are not likely to be severe because fewer species desirable to the gypsy moth are present Therefore, it is less likely that defoliation levels will be high enough to lead to widespread mortality. The young regeneration produced by harvests will further decrease the chance of catastrophic disturbance from gypsy moth.

Vegetation Manipulation in Alternatives 2, 4, 5, 7, 8, 8A, 9, 10, 11, 12, 13, 14. Both even-aged and uneven-aged cutting methods can be used. Each can result in very different effects on regeneration species composition Prescribed burning is not anticipated to occur.

Individual tree selection can be implemented in many stands of this type-group This cutting method will eventually result in a stand composed almost entirely of more shade tolerant species such as red maple, beech, or hemlock. This method has the least amount of canopy disturbance, but the least chance of maintaining the less tolerant oaks in the stand.

Group selection cutting methods on areas up to 2 acres can provide for development of stands of intermediately tolerant species such as black cherry, red oak, and ash. Problems relating to deer browsing in the small openings are similar to those for the white oak-black oak group and could result in not obtaining the desired species.

Even-aged cutting reproduces less tolerant, fast growing species such as red and white oak and white pine. The shelterwood or seed tree methods would possibly favor species of intermediate shade tolerance. However, the methods have not been widely applied in Appalachian hardwood forests. The tendency for striped maple to respond significantly to partial or full openings in the canopy complicates the vegetation response on northern aspects at high elevations.

The seed tree method or removal cutting might achieve the desired vegetation response in stands being naturally regenerated to white pine or white pine-hardwoods.

The clearcutting method can be used to obtain regeneration of less shade tolerant species. The stumps of hardwood trees sprout well and the advance reproduction responds well to the opening of the canopy. On these good sites, growth is rapid and abundant with many species of trees and other plants Many species compete for a dominant position. The regrowth of vegetation is rapid.

Species such as striped maple, dogwood, and grapevine can often interfere with and reduce growth and numbers of less tolerant species.

Yellow Poplar-Mixed Hardwood Type-Group

The yellow poplar-mixed hardwood type-group is generally found on deep, well drained soils, gently sloping terrain on lower slopes or bottom-lands, northwest to southeast aspects, and cove sites. The yellow poplar site index is 80 to 130. Approximately 20 percent of the forested land, or roughly 200,000 acres, is in this type-group.

Associated forest cover-types are. yellow poplar (SAF 57); yellow poplar-eastern hemlock (SAF 58); yellow poplar-white oak-northern red oak (SAF 59), and eastern hemlock (SAF 23).

Understory vegetation in this group contains many of the same species found in the sugar maple-mixed hardwoods group, except for striped maple. Striped maple is not usually present.

On the Forest, this type-group is often found in narrow stringers along streams Surrounding vegetation is different because of abrupt changes in terrain and site quality.

When this type occurs away from stream-sides, the stands cover more extensive areas. The presence of yellow poplar is the unique feature of this group. An intolerant fast growing tree, it has the ability to quickly establish itself on a site once sufficient sunlight becomes available. Seeds lie dormant in the duff of the forest floor for a long time. Yellow poplar seeds germinate and grow rapidly following a disturbance that allows sunlight to reach the forest floor.

Old growth characteristics will develop which are consistent with forests that have frequent, low intensity, local disturbance episodes such as single tree gaps caused by wind or ice storms.

Additional information on associated forest type descriptions including associated trees, shrubs and herbaceous plants can be found in Chapter III of the *Final Environmental Impact Statement for Vegetation Management in the Appalachian Mountains* (July 1989).

Effects of Alternatives 3, 6, 9

These alternatives do not use vegetation disturbance management techniques in this type-group. Therefore, impacts are indirect and take place over a long period of time as vegetation responds to natural processes.

Diversity of Vegetation in Alternatives 3, 6, 9. Yellow poplar should remain a component of this type-group. However, it may decline from its dominant position as other hardwoods become more numerous.

Even though yellow poplar is classed as intermediate in shade tolerance, it can overcome other more tolerant competition because it produces many seedlings and grows rapidly. It has faster height-growth on good sites than any of its associates except white pine (Olsen, 1969).

Seeds retain viability in the forest floor from 4 years to 7 years (Clark and Boyce, 1964). This large buildup of seed is capable of producing abundant seedlings when suitable conditions exist. Full sunlight is not needed for seedling establishment, but germination will not occur without some opening in the overstory. Usually, 0 05 acre to 5 acres will yield similar numbers of seedlings per acre. Height growth is severely retarded in openings of less than 1 acre (Clark, 1970).

There should be little change in the understory species which are predominantly herbaceous plants and small trees.

The understory of herbaceous plants is varied and abundant on the moist, rich soils of this type-group. Vines can be extremely damaging to yellow poplar. The

most widespread damage throughout the Appalachians results from wild grapevine, Vitis spp. (Smith and Lamson, 1975). Shrubs are not abundant. There are some small tolerant trees such as dogwood. Ferns are often numerous. Barring any large disturbances to the overstory, the understory should show little change even if the amount of yellow poplar declines.

Resource Sustainability In Alternatives 3, 6, 9. Yellow poplar should become more prevalent in stands defoliated by gypsy moth because the associated oaks are more susceptible to defoliation than yellow poplar.

Yellow poplar is unusually free from pest damage in comparison to other trees. While more than 30 species of insects attack yellow poplar, only four species have significant impacts (Renshaw and Doolittle, 1958). Gypsy moth is not one of the four. If gypsy moth infestations spread and remain on forests over a period of years, the oak component of this type-group declines from mortality due to defoliation and secondary insect and disease attack. The openings created in the overstory from the loss of oak will provide sufficient sunlight to allow viable yellow poplar seed in the forest floor litter to germinate. Yellow poplar should be able to compete with red maple and white pine and eventually gain a dominant or co-dominant position.

Fire can easily kill the thin-barked yellow poplar, but regeneration from dormant seed may be enhanced by fire. However, fire occurrence may be less frequent in many areas in this alternative. Prescribed burning is not anticipated to occur in this type group.

Fire can be a good source of putting yellow poplar seeds in contact with mineral soil or clearing away excessive herbaceous and shrub vegetation to allow germination. Existing seedlings and saplings will be killed by most fires because of the thin bark of yellow poplar.

Vegetation Manipulation In Alternatives 3, 6, 9. Clearcutting is not allowed. However, some catastrophic disturbances -- if they occur -- will have impacts similar to clearcutting on overstory and understory vegetation. Secondary succession will occur in these instances.

Effects of Alternatives 2, 4, 5, 7, 8, 8A, 10, 11, 12, 13, 14

Diversity of Vegetation in Alternatives 2, 4, 5, 7, 8, 8A, 10, 11, 12, 13, 14. The disturbance created by cutting practices will effect species diversity in the overstory and understory. Species diversity on the site will increase immediately following disturbance due to conditions favorable for early successional species. Eventually, species diversity will return to pre-disturbance numbers. The existing variety of forest types, age classes, and understory plant communities is present because of natural and man-caused disturbances in the past. These disturbances modify the process of forest succession. With disturbance, a mixture of light intolerant and tolerant tree species of all ages is maintained instead of a shift to mostly light tolerant species and a less broad mix of ages. The effects will vary among alternatives relative to the total area of suitable acres and allowable sale quantity (ASQ).

Resource Sustainability in Alternatives 2, 4, 5, 7, 8, 8A, 10, 11, 12, 13, 14. The regeneration created from harvest methods will make this type-group less likely to experience catastrophic gypsy moth defoliation and mortality among the hardwood component.

Vegetation Manipulation in Alternatives 2, 4, 5, 7, 8, 8A, 10, 11, 12, 13, 14. Clearcutting, modified shelterwood, and group selection will provide sufficient sunlight to stimulate regeneration of yellow poplar. Yellow poplar will remain a significant part of this type-group. Understory plant communities should be able to maintain diversity due to harvesting disturbances

Individual tree selection may not provide enough canopy disturbance to allow the needed amount of sunlight to stimulate germination of yellow poplar seed and maintain vigorous seedling growth.

Seed tree and shelterwood have little practical utilization because enough yellow poplar seed to regenerate the stand is already available in the duff of the forest floor. The removal of the overstory trees could result in mechanical damage to the established seedlings or saplings.

Clearcutting will result in abundant seedling growth of yellow poplar. Sprouts and advance reproduction of other species will also be abundant.

VISUAL RESOURCES

The George Washington National Forest extends over 140 miles in length and covers over a million acres of the picturesque mountains and valleys of northwest Virginia and eastern West Virginia. Steeped in the American traditions of the Shenandoah Valley and the Allegheny and Blue Ridge mountains, the Forest has been a travel-way for Native Americans, a passageway for pioneers, and the setting of Civil War battles. Throughout historic times, and no doubt in prehistoric times as well, people have enjoyed the beauty of the Forest.

Five ranger districts -- Deerfield, Dry River, James River, Lee, and Warm Springs -- lie in the Appalachian Ridge and Valley landscape character type. This land is an assemblage of valley floors and long, narrow, evenly-topped mountain ridges Either of these elements may predominate. The mountains are either widely spaced and isolated or are so closely ranged that the lowlands are disconnected or absent. Valley floors are trenched by clear, rushing streams.

The sixth ranger district -- the Pedlar -- lies across the historic Blue Ridge landscape This belt of mountains lies in a northeast-southwest direction Summits are commonly rounded. Mountains which could be called peaks are few, but are distinctly separate from the adjacent ridges Steep slopes are dissected by narrow valleys

The visual resources on all districts benefit from the four distinct seasons of a hardwood forest -- the spring blossoms of understory trees, the rich full greens of summer, the fiery reds and ambers of fall, and the serenity of winter.

Four elements are involved in inventorying the visual resources on the Forest: the sensitivity of the public to the landscape and their expectations for a particular area; the beauty created by the diversity of landscape elements such as rockforms, landforms, and water bodies, the travel corridors and the distances from which the landscape is seen, and the legal and administrative plans for specific areas

An inventory of the visual resources of the Forest was completed during the planning process This inventory was based on the Visual Management System as explained in Agricultural Handbook Number 462, *National Forest Landscape Management*, Volume 2, Chapter 1. Extensive public input was considered and applied with professional judgement in determining this inventory. A presentation of this inventory by acreage follows for comparison to all alternatives.

Effects of the Alternatives

Table 3-31 summarizes acres by inventory and by adopted VQO on the Forest by alternative. The maximum modification VQO has been eliminated from all alternatives because it is either unacceptable or inconsistent with all recreation opportunity spectrum classifications that are appropriate for the Forest. The inventory had approximately 13,400 acres classed with the maximum modification VQO. This acreage has been allocated to other VQO classifications.

The inventoried acreage is derived using the National Forest Visual Management System (VMS) without consideration for management activities. The no action alternative in the Draft Plan, Alternative 2, listed acreage as adopted for management under the 1986 Plan. For the Revised Plan, the acreage listed for Alternative 2 equals that of the inventory. This is considered current direction and is more appropriate for the plan revision process.

Table 3-31.
Visual Quality Objectives by Alternative in Thousands of Acres

Alt. No	Preservation	Retention	Partial Retention	Modification
2[1]	34	94	279	654[2]
3	1055	6	0	0
4	32	662	9	358
5	32	112	9	908
6	246	328	483	4
7	32	54	971	4
8	44	497	447	73
8A	46	379	548	88
9	536	516	5	4
10	35	392	474	160
11	318	204	535	4
12	32	148	671	210
13	431	294	332	4
14	44	321	508	188

[1]Existing inventory.
[2]Includes 13,000 acres of maximum modification.

A major impact of the preservation VQO in all alternatives will result from gypsy moth defoliation and mortality. As this ecological change occurs, many trees will die and remain as dead snags. Preservation acreage will vary more or less by alternative as indicated in Table 3-31.

In all alternatives, utility corridors present a marked contrast in line, form, and texture to the natural landscape. These contrasts are mitigated to the extent practical.

Developed recreation areas, administrative sites, and communications sites also contrast with the surrounding landscape. These are rehabilitated, designed, and constructed under all alternatives to the extent feasible in a manner that minimizes contrasts and harmonizes with the natural environment.

All alternatives allow for the application of the enhancement and rehabilitation VQO's These short term VQO's are applied when necessary and appropriate in order to meet a long term VQO They will not be applied where a preservation VQO has been adopted An example of this is the application of a rehabilitation VQO in a retention zone that has extensive mortality from gypsy moth defoliation. The removal of dead snags and other efforts to clean up the area are necessary in order to meet the long term retention VQO. Enhancement is applied when visual resources are of primary importance in order to open vistas or otherwise enhance the scenic resources of the Forest.

The foreground of the Appalachian National Scenic Trail is managed with specific visual management guidelines in all alternatives except alternative 3. In Alternative 3 it is assigned a preservation VQO

All alternatives have extensive consideration for the visual resources of the Forest. Degree of precedence with regard to the management for other resources varies by alternative. Except in Alternative 2, all adopted VQO's are compatible with the ROS classification adopted for each management area in accordance with Forest Service Manual direction and the 1986 ROS Book. This direction has the effect of subordinating visual resource inventory to the ROS classifications. The more primitive ROS classifications have the more restrictive VQO's In other words, areas with a Modification VQO on the inventory will have a Partial Retention VQO adopted in order to be compatible with the semi-primitive motorized ROS.

Standards have been developed to guide vegetation management, road construction, and other management activities relative to visual resources. Contrast reducing techniques appropriate for each management practice and VQO are given and are applicable under all alternatives.

Alternative 2 adopts the VQO inventory for visual resource management direction as updated during the planning process. The scenic resources of the Forest as viewed from visually significant travel routes remain essentially unchanged from the present. Management activities may be observed, however, visual contrasts will be held to a minimum according to the inventoried VQO

Alternative 3 calls for an environment unaffected by man's activities. It applies a preservation VQO to the entire Forest with the exception of utility corridors and developed recreation sites. Utility corridors will be managed with a long term VQO of retention. This accepts the fact that existing pipelines and power lines will remain. However, short term VQO's of rehabilitation and enhancement may need to be applied from viewing points and travel routes to enable the utility corridors to meet the retention objective Under Alternative 3, management activities are prohibited except for low-visual impact recreation facilities and habitat improvement for threatened, endangered, and sensitive species Recreation facilities are installed only to prevent degradation of other resources to the extent practical and will meet a retention VQO Facilities are installed only after a determination is made that there is no practical alternative.

Existing openings created by timber harvesting, road building, and other management activities gradually close under Alternative 3 and blend with the natural appearance of the environment.

Under **Alternative 4**, nearly two thirds of the Forest is managed with a retention VQO and provides motorized recreation opportunities This area is considered unsuitable for timber production An extensive OHV network provides access to the Forest with the natural environment retained Management activities are not noticed by the casual viewer

This alternative adopts a modification VQO on one-third of the Forest. Visual resources are subordinate and motorized recreation opportunities are extensive. Roads constructed for timber harvests provide OHV recreation upon completion of the harvesting.

Alternative 5 provides an uninterrupted flow of marketable goods and services Management for the protection or enhancement of visual resources of the Forest is subordinate to timber and wildlife objectives. A large portion of the Forest, nearly two-thirds, is managed with a modification VQO Management activities are readily apparent to viewers from many travel routes Within the general Forest area, only the areas seen from the most sensitive travel routes and viewing points receive a VQO that is more restrictive than modification

Under **Alternative 6**, with its emphasis on nonmarket (amenity) goods and services, the Forest is managed with a full range of VQO's. The preservation VQO is applied to wildernesses and roadless areas recommended for wilderness study. Retention is adopted in a manner similar to the VQO inventory in the foreground zones of visually sensitive travel routes. The rest of the Forest receives a partial retention VQO except utility sites and corridors

The difference from current management in Alternative 6, with regard to visual resource management, is in the seldom seen areas where a partial retention VQO is adopted (except where preservation is adopted as discussed above) This results in management activities being visually subordinate throughout the Forest

Under **Alternative 7**, emphasis is placed on wildlife habitat management. Existing wildernesses adopt a Preservation VQO. Special interest, biological, geological and historical areas along with rivers eligible for Scenic River designation receive a Retention VQO. Utility sites and corridors adopt a modification VQO. With the modification VQO, management activities may dominate the characteristic landscape This will be the situation in the foreground zones of visually sensitive travel routes to a greater extent than under current management.

The vast majority of the Forest adopts the Partial Retention VQO. Wildlife habitat objectives take precedence over visual resources, however most activities will remain visually subordinate to the characteristic landscape and the Partial Retention VQO will be met Under Alternative 7, management activities are less visible than under current management.

Alternative 8 has a large portion of the Forest classed with a partial retention VQO managed for wildlife and considered unsuitable for timber production. Wildlife management activities will remain subordinate to the characteristic landscape to the extent practical Alternative 8 has nearly a half-million acres classed with a retention VQO. In this area, there will be no evidence of management activities Under Alternative 8, fewer management activities will be seen than under current management

Alternative 8A also has a large portion of the Forest classed with a Partial Retention VQO managed for wildlife and dispersed recreation Management activities may be visible, but will generally not detract from the visual qualities of the Forest. With over half of the Forest classed with Partial Retention and 367,000 acres with the Retention VQO, visual resources will receive greater emphasis than under current management.

Alternative 9 emphasizes unfragmented forest and has a large wilderness program. The Preservation VQO is adopted on over half of the Forest. Management activities are prohibited except for low visual impact recreation facilities and habitat improvement for threatened, endangered, and sensitive species. Evidence of past human intervention will diminish over time. Depending upon the degree to which natural fire will be permitted to burn, much of the Forest will age and increase in late successional species. The Forest mosaic will be a product of natural occurrences such as fire, ice storms, diseases and pests.

The other half of the Forest primarily adopts the Retention VQO. Permissible management activities will not be noticed by casual observers. Less than one percent of the Forest adopts the Partial Retention and Modification VQOs. Overall, the visual resources of the Forest appear natural and untouched by man.

Adopted VQOs under **Alternative 10** reflect an above-cost timber sale emphasis Some of the visually sensitive travel routes in the Forest receive a Modification VQO. Along these routes and general Forest areas with high value timber stands, management activities are more evident than under current management. However, overall acreage with a Modification VQO is reduced by nearly half a million acres from the current inventory.

Most of the Forest adopts the Retention and Partial Retention VQOs under Alternative 10 Management activities are planned and executed in such a way as to be not noticeable by the casual observer, or to remain visually subordinate to the characteristic landscape.

Alternative 11 emphasizes dispersed and remote recreational experiences. Over 300,000 acres of the Forest adopt a Preservation VQO. Management activities are limited to very low impact recreation facilities added only for resource protection. This land will appear natural and be viewed as unchanged except for long term ecological progression. Areas of heavy gypsy moth defoliation and resulting mortality will have a quicker, readily apparent change.

Partial Retention comprises the majority of the Forest Permissible management activities may be evident to casual observers, but remain visually subordinate to the characteristic landscape Management activities are less evident than under current management.

Alternative 12 has a larger timber program than under current management, however the acreage adopting the Modification VQO is approximately one-third of the current VQO inventory. Nevertheless, many management activities will still be highly visible because Modification is adopted adjacent to some of the Forest's visually sensitive travel routes.

Under Alternative 12, over half of the Forest adopts the Partial Retention VQO. Timber management is emphasized, and activities may be visible to the casual observer. However most timber activities will meet the Partial Retention VQO by remaining subordinate to the characteristic landscape.

Alternative 13 de-emphasizes timber production and emphasizes non-motorized dispersed recreation. Acreage managed in a preservation zone or scenic classification increases considerably over existing management. The Forest maintains a natural appearance. Evidence of change comes with long term natural progression, not as a result of man's activities. In the short term, change will be apparent only where drastic change happens as a result of natural causes such as gypsy moth defoliation and wind or ice storms.

A little over half of the Forest adopts the Retention and Partial Retention VQOs. Management activities will be subordinate or not apparent from visually sensitive travel routes. Fewer management activities will be seen than under current management.

Management under **Alternative 14** will result in management activities being less evident than under current management The Preservation, Retention, and Partial Retention VQOs all increase in acreage while the Modification VQO decreases as compared with the current inventory. Nevertheless, this alternative has the third highest allocation of the Modification VQO. Management activities will be evident in those areas.

WATER

The Forest is almost equally divided between the Potomac and James river basins. Tributaries of the Potomac in the vicinity of the Forest include South Fork South Branch of the Potomac and the Lost, Cacapon, Shenandoah (North and South forks), Dry, North, and Middle rivers. Rivers tributary to the James include the Jackson, Bullpasture, Cowpasture, Calfpasture, Maury, South, St. Mary's, Pedlar, Buffalo, and Tye

Quality

Water quality is generally very good for the beneficial uses of water on the Forest Beneficial uses include public water supplies, cool water fisheries, stocked trout fisheries, stockable trout fisheries, and wild trout fisheries However, acid deposition from sulfur and nitrogen gases is beginning to affect Forest streams Due to the geologic formations underlying the Forest, most of the Forest's streams are low in buffering capacity and thus sensitive to acid deposition. The Virginia Trout Stream Sensitivity Study found that 10 percent of the Forest's trout streams are critically sensitive (i.e , acidic) and another 70 percent are sensitive or extremely sensitive

Long term monitoring on the Forest is limited, but a trend of increasing sulfates was found in Mill Run on Massanutten Mountain. Declines in acid-sensitive fish and aquatic insects have been documented on St Mary's River, where pH and alkalinity are low Adsorption of sulfates by soils is slowing pH declines on the Forest, but adsorption capacities of soils are limited and will eventually be exhausted at the present rate of sulfate deposition

Effects of the Alternatives

Acid deposition is derived from off-Forest sources and is unaffected by management activities. It, therefore, does not vary by **alternative**.

In **all alternatives**, the Forest complies with the Clean Water Act and protects beneficial uses through the use of Virginia and West Virginia Best Management Practices (BMPs) and other standards and guidelines that provide additional protection of water quality. A monitoring program evaluates the effectiveness of this protection thus providing a feedback process to continually adjust BMPs and Forestwide standards as needed to improve implementation and effectiveness.

Table 3-32 shows the total sediment delivered to streams from National Forest System land. Total sediment includes sediment from both natural (mostly channel and streambank) and human-caused sources

Alternative 3 produces the least sediment because many roads are closed and soil disturbing activity is minimal. Due to its high level of timber harvest and associated road construction, **Alternative 7** produces the most sediment.

Table 3-32.
Total Sediment (natural and human-caused) Delivered to Streams*

Alternative	Average Annual Sediment (In Thousands of Tons) During the First Decade
2	22 8
3	20 8
4	23.9
5	23.9
6	21 3
7	24 0
8	22.5
8A	22.9
9	21.5
10	21.9
11	22.3
12	23 5
13	22.1
14	22 8

*Natural sediment averages approximately 20 1 thousand tons/year

In Alternatives 4 and 5, up to 50 percent of the overstory can be removed from streamside shade strips during timber harvests This may result in small localized increases in stream temperature, but streams will usually cool rapidly as they flow through the uncut forest downstream (Burton and Likens, 1973; Patton, 1980). All other alternatives provide shade strips or unharvested riparian areas that fully protect streams from temperature increases Alternatives 7, 8, 10, 12 and 14 allow some timber harvests in riparian areas, but require shade strips of 66 feet with no more than 20 percent overstory removal. In Alternative 8A, the first 66 feet of all riparian areas are unsuitable for timber management Riparian areas narrower than 66 feet are further protected by 66-foot shade strips with no removal of more than 20 percent of the basal area of dominant and co-dominant trees. Research indicates that shade strips of these widths and harvest intensities should prevent temperature increases (Brown, et al, 1971; Patton, 1980).

Quantity

Approximately 1,287 miles of perennial streams and 51 impoundments larger than 1 acre are located on Forest land or inundate Forest land during high flows These impoundments were built for flood control, recreation, fisheries, wildlife, water quality control, and hydroelectric power. Several natural ponds also occur.

Non-flowing surface water is approximately 3,190 acres, including Lake Moomaw (2,530 acres).

Average annual surface-water yield from the Forest is about 1,300,000 acre-feet This accounts for about 9 percent of the flow reaching Richmond, Va., and Washington, D C., by way of the James and Potomac rivers.

While streams are numerous, surface flow becomes critically low in many channels during the summer months.

Timber harvests increase water yield A forest loses water through the process of evapotranspiration at its maximum rate when the forest is mature. When the timber is harvested, this loss of water is greatly reduced With less water being removed by trees, there is more water that can move through the soil and enter streams (Douglass, 1983). Most of this increase occurs during the growing season and thus augments summer low flow. The increase in water yield varies with the proportion of timber removed from an area with clearcutting producing the greatest yield As the timber regrows, the increase in water lessens year-by-year, so that within 17 years streamflow returns to normal

The effect of gypsy moth on water yield is uncertain Heavy defoliations may cause short-term increases in water yield Where tree mortality is severe, long term increases -- similar to those from timber harvesting -- may occur.

Effects of the Alternatives

Table 3-33 shows the water yields expected under each alternative Changes from the present yield are small. **Alternative 3** has the lowest water yields, since essentially no timber is harvested. **Alternatives 5 and 7** have the highest level of timber harvest and thus, produce the most water.

Table 3-33.
Average Annual Water Yield

Alternative	Thousands of Acre-Feet Period 1	Period 5
2	1,320	1,313
3	1.314	1,305
4	1,320	1,314
5	1,325	1,320
6	1,320	1,316
7	1,324	1,318
8	1,318	1,310
8A	1,319	1,311
9	1,315	1,308
10	1,316	1,308
11	1,318	1,312
12	1,321	1,315
13	1,316	1,309
14	1,319	1,313

Water Uses

Total current surface water use (water withdrawn directly from the Forest for municipal, domestic, recreational, industrial, and livestock uses) is estimated to be 7,836 million gallons (24,047 acre-feet) per year This use is less than 2 percent of the surface water yield Additional surface water is withdrawn farther downstream. Groundwater use (wells and springs) is estimated at 140 million gallons (430 acre-feet) per year.

Demand for water is expected to increase where population increases are anticipated. *Virginia's Water Supply Statewide Summary and Technical Data* (1988) predicts for the Shenandoah River Basin an increase in combined surface and groundwater demand from 98 million gallons per day (MGD) in 1980 to 121 MGD in 2030

In the same period, demand will increase in the Potomac River Basin (excluding the Shenandoah River Basin) from 128 MGD to 220 MGD, and in the James River Basin from 594 MGD to 770 MGD. The following local water supply systems are expected to have source problems by 2010; i.e., the existing source cannot provide an adequate quantity of water to meet the future demand: Dooms/Harriston, Waynesboro, Bridgewater, Dayton, Elkton, Massanutten PSA, Shenandoah, Stony Creek Sanitary District, Broadway, Toms Brook-

Maurertown Service Authority, Craigsville, and Millboro Water Association Bridgewater is presently seeking to triple its capacity to withdraw water from North River Harrisonburg is developing plans for an increase in withdrawals from Switzer Lake.

Increasing water demands may compete with some in-stream water uses In-stream water uses include flood control, recreation, fisheries, wildlife, channel maintenance, and maintenance of water-dominated ecosystems such as wetlands, flood plains, riparian areas. The amount of in-stream flow needed has not been determined.

Flooding

Flood flows have been responsible for considerable economic damage and loss of life in the area These floods occurred when heavy rains fell on soils already saturated The worst floods occurred in 1969, 1972, and 1985 To help moderate flooding, 18 flood control dams have been built on or adjacent to the Forest. The Soil Conservation Service has identified other potential flood control impoundment sites on or adjacent to the Forest, but none are proposed for construction in the near future.

Effects of the Alternatives

No **alternative** increases the potential severity of major floods. Research shows that timber harvesting has negligible effects on flood levels in large streams (Lull and Reinhart, 1972) (Hewlett, 1982). Large storms generally occur during the dormant season when the soil is saturated and the presence or absence of trees has little effect on water yield. Because only a small percentage of the Forest is cut in a given year in any **alternative**, any effects on stormflow are further reduced

Groundwater

Bedrock, which has poor-to-fair groundwater yields, lies under most of the Forest The rocks are tightly-cemented and consolidated and thus, not very permeable. Primary porosity (pore space) is lacking in these rocks, so secondary porosity (fractures and interfaces between rock layers) are the main conduits for water to enter the groundwater system. Where mountain slopes on the Forest are steep and the soil is shallow, surface water is further inhibited from penetrating deep into the underlying rock.

Although common in the Valley and Ridge Province, the Forest does not have the large limestone valleys which often contain significant groundwater resources.

Groundwater aquifers (water-bearing rocks) on the Forest are commonly limited in extent, meaning that the system is often a closed one, having little influence on deeper, more regionally important aquifers. They often have discharge points under local stream channels, springs, and valleys.

Aquifers with higher yield potential are located along the western slope of the Blue Ridge in the Cambrian-aged limestone formations and scattered throughout the Valley and Ridge Province within the lower Devonian-aged limestones

Aquifers most susceptible to contamination from human sources are the limestones and dolomites. Aquifer recharge areas on the Forest (where surface water can enter the groundwater system through a variety of means) have not been mapped in detail, but forest management activities do not measurably impact the groundwater resource Impacts are limited because of the Forest's active role in watershed protection, such as floodplain and riparian area protection.

Groundwater quality on the Forest is generally good. There are localized conditions of high iron concentrations and hard water

Effects of the Alternatives

Since Forest management practices do not measurably impact the groundwater resource, impacts do not vary measurably by **alternative.**

Riparian Areas

The Forest has approximately 32,200 acres of riparian areas Riparian areas are composed of aquatic ecosystems (stream channels and lakes), riparian ecosystems, and wetlands Lakes and reservoirs on the Forest total approximately 3,200 acres while other riparian areas total approximately 29,000 acres

These areas have distinctive resource values, which include groundwater recharge, moderation of flood peaks, visual and recreational enjoyment, timber production, wildlife and fisheries habitat, cultural resources, and streamside vegetation. Not all of these values are important in each riparian area

Most perennial streams are in steep mountain valleys with little floodplain and little transition area between the upland and aquatic ecosystems. Small wetlands can be found on the Forest, but are relatively uncommon

Riparian areas are often among the most productive areas and thus provide some of the best timber and wildlife habitat, as well as opportunities for forest types to develop the most commonly perceived old growth characteristics (i e. large tree size, large standing snags, abundant down woody debris).

Some animals and plants are dependent on riparian areas Riparian dependent animals include certain species of bats, invertebrates (e.g , snails, crayfish), amphibians and reptiles (e g., wood turtle, red-spotted newt, queen snake), and birds (e.g., northern waterthrush, wood duck). Swamp pink, cranberry, buttonbush, and pipewort are examples of riparian dependent plants Many of these plants are limited to wetlands.

See FISHERIES for a description of the fisheries resource.

Effects of the Alternatives

In **Alternatives 2, 11, and 13**, riparian areas are unsuitable for timber production and are managed to protect or enhance riparian dependent resources

In **Alternatives 3 and 9**, riparian areas are essentially undisturbed by management activities.

Riparian areas in **Alternatives 4 and 5** are suitable for timber production when adjacent to other suitable lands. Harvesting is accomplished in accordance with State Best Management Practices, which allow up to 50 percent overstory removal in Streamside Management Zones (SMZs) (minimum 50 feet). Where riparian areas extend beyond the SMZ, timber may be harvested using methods appropriate for the adjacent management area Harvests result in early successional vegetation Some riparian dependent species, such as some salamanders, are temporarily displaced as shade removal results in warmer, drier conditions Removal of mature timber provides habitat for early successional and edge species. Habitat for species preferring large diameter trees (such as the pileated woodpecker) or continuous canopy cover (certain neotropical migrants) is lessened

In **Alternative 6**, all riparian areas are unsuitable for timber production In most riparian areas, management practices are excluded, but within portions of the Forest that are managed to maintain or enhance wildlife habitat (Management Areas 14 and 15), riparian area habitats are actively managed to enhance riparian dependent resources.

Riparian areas in **Alternative 7** are managed to protect or enhance riparian dependent resources. They are unsuitable for timber production, but timber harvests can be used to create small openings for grouse habitat.

In **Alternatives 8, 10, 12, and 14**, riparian areas are managed toward providing self-maintaining habitats that will maintain the desired future condition for riparian dependent resources. As long as riparian dependent resources are being maintained, up to 20 percent overstory removal is allowed in SMZs (minimum 66 feet) that are adjacent to management areas where the timber is suitable for harvesting Timber harvests are not permitted in SMZs of wild trout streams. Where riparian areas extend beyond the SMZ, harvesting is limited to group selection and small even-age units of an average harvest intensity less than 7 percent per decade. These limited harvests do not appreciably change habitat for riparian dependent wildlife and plants

Likewise, in **Alternative 8A**, riparian areas are managed toward providing self-maintaining habitats that will maintain the desired future condition for riparian dependent resources Vegetation management occurs only if consistent with the desired future condition. Riparian areas are suitable for timber production only if they are adjacent to suitable lands in other management areas and do not include native trout streams. Moreover, only those portions of these riparian areas that extend beyond 66 feet from a bank are suitable for timber production. Habitat for riparian dependent wildlife and plants will not appreciably change.

Riparian area vegetation in all alternatives generally progresses toward late successional stages except where suitable for timber production (**Alternatives 4, 5, 8, 8A, 10, 12, and 14**) or where harvests are used to create openings for grouse (**Alternative 7**) Table 3-34 shows, by alternative, the approximate percentage of riparian areas that are suitable for timber production.

Table 3-34.
Riparian Areas Suitable for Timber Management (Percent)

Alternative	Percent
2	0
3	0
4	46
5	66
6	0
7	0
8	18
8A	5
9	0
10	9
11	0
12	33
13	0
14	22

WILD AND SCENIC RIVERS

In or near the Forest, 13 rivers have been studied to determine whether or not they are eligible for National Wild and Scenic River designation. Of the 13 rivers studied, two rivers and segments of eight other rivers were found to be ineligible. The remaining 12 eligible rivers or river segments traverse 12 counties in Virginia and West Virginia and have a combined length of 253 55 miles. A summary of the rivers determined to be eligible is in Table 3-35. Appendix D contains the Eligibility Study in its entirety.

Rivers found eligible need further study to determine if they meet suitability criteria and should be recommended to Congress for addition to the Wild and Scenic River system Until a final determination is made as to suitability or nonsuitability, the Forest Service is obligated to protect those qualities that made the rivers eligible.

The Alternatives

In all alternatives, protection is provided within a one-quarter mile corridor on each side of an eligible river (one-half mile total). Management activities allowed within this corridor are designed to meet the minimum protection requirements, given the river's potential classification. Management Area 10 in the Revised Plan (Chapter 2) describes these minimum protective measures

The portion of the St. Mary's River that runs through St. Mary's Wilderness (Segment A) is the only river that is eligible for designation as a "wild" river. Under **all alternatives**, the St. Mary's River and its surrounding one-half mile corridor are allocated to wilderness management Protection of the river's values is guaranteed due to the fact that wilderness standards are more restrictive than the minimum "wild river" Wild and Scenic River standards.

For **each alternative**, the eligible rivers and surrounding one-half mile corridors receive, as a minimum, protection as outlined in the standards for Management Area 10 In **Alternatives 4, 5, 8, 11, 12, 13, and 14**, there are some suitable lands located within the river corridors Any regeneration harvesting in these corridors is accomplished in a manner that is consistent with maintaining scenic or recreational river characteristics.

Table 3-35.
Summary of Wild and Scenic River Eligibility Determinations

RIVER	COUNTY AND STATE	LENGTH (Miles)	POTENTIAL CLASSIFICATION
BACK CREEK			
Segment A	Bath, VA	5 59	Scenic
Segment B	Bath, VA	9 96	Recreational
BULLPASTURE RIVER			
Segment A	Bath/Highland, VA	3.00	Scenic
CEDAR CREEK	Shenandoah/ Frederick, VA	25 00	Scenic
COWPASTURE RIVER			
Segment A	Alleghany, VA	16 00	Recreational
Segment B	Bath, VA	48 11	Recreational
JACKSON RIVER			
Segment B	Bath, VA	7 06	Scenic
Segment C	Bath, VA	8 33	Scenic
Segment D	Alleghany, VA	13 00	Recreational
NORTH RIVER			
Segment B	Augusta, VA	5 00	Scenic
PASSAGE CREEK			
Segment B	Shenandoah, VA	21 30	Recreational
Segment C	Shenandoah, VA	6 90	Recreational
ST MARY'S RIVER			
Segment A	Augusta, VA	4 60	Wild
NORTH FORK SHENANDOAH	Shenandoah/ Frederick, VA	39 00	Recreational
SOUTH FORK SHENANDOAH	Page/Warren, VA	36 00	Recreational
TYE RIVER			
Segment B	Nelson, VA	4 70	Scenic
	TOTAL	**253.55**	

WILDERNESS

Four wildernesses containing a total of 32,269 acres are located on and managed by the George Washington National Forest (the Forest): St. Mary's, 10,000 acres, Ramseys Draft, 6,519 acres, Rich Hole, 6,450 acres; and Rough Mountain, 9,300 acres. In addition, small portions of two wildernesses administered by the Jefferson National Forest are located on the George Washington. These include 20 acres of the 5,700-acre Barbour's Creek Wilderness and 95 acres of the 3,665-acre Shawvers Run Wilderness.

Each of the four wildernesses on the Forest has a citizen group that meets to discuss management issues and concerns specific to the area. Each area also has a Wilderness Implementation Schedule and Fire Management Direction Document that outline site-specific direction for managing the wilderness. The Limits of Acceptable Change Planning System is used to update implementation schedules as needed.

The illegal use of vehicles and the impacts of human recreation use are primary management concerns, especially in Ramseys Draft and St. Mary's Wildernesses where visitor use is high. Day-use accounts for approximately 90 percent of the use in St. Mary's and approximately 70 percent in Ramseys Draft. The number of visitors to the Rough Mountain and Rich Hole wildernesses is low.

Effects of the Alternatives

The amount of wilderness on the Forest does not differ among the alternatives. In some alternatives, expansion of the existing wildernesses is proposed by allocating adjacent lands to the wilderness study category. See the ROADLESS AREAS section for a discussion of these areas.

WILDLIFE

Invertebrates

In the Appalachians, invertebrates consist largely of two groups, arthropods and mollusks. Arthropods are the most numerous of all living organisms. The species of insects alone outnumber those of all other animals and plants collectively by a factor of at least ten. Mollusk species in this region consist of freshwater mussels, fingernail clams and snails.

The number of invertebrate species on the Forest is unknown. A few groups, such as butterflies, dragonflies, cave invertebrates, and freshwater mussels, are better known and more widely studied. Of the studies and inventories carried out to date, most invertebrate species are widespread on the Forest and those which may be considered rare occur in specified and unique habitats such as caves, shale barrens, high elevations red spruce forests, aquatic, and riparian areas (per. comm. Dr. Richard Hoffman, Curator of Recent Invertebrates, Virginia Museum of Natural History).

Amphibians and Reptiles

Approximately 70 species of amphibians and reptiles are known to inhabit the Forest. The Forest is well known for its abundance of salamander species -- more than 20 -- including the endemic Cow Knob salamander and the rare eastern tiger salamander.

Birds

The Forest provides habitat for approximately 175 species of birds (permanent residents/migrants/transients). Sixty percent of neo-tropical migrants (winter in Latin America/nest on the Forest) are considered to be area-sensitive, requiring large blocks of relatively undisturbed forest habitat. Forty percent of neo-tropical migrants, including several which have declined the most in recent years, require early successional shrubby habitat.

Mammals

Over 55 species of mammals occur on the Forest Of particular interest are the eight species of shrews and 10 species of bats. The rock shrew and pigmy shrew are considered to be rare in Virginia, but are relatively common on the Forest. The Forest provides Virginia's only known habitat for the water shrew, rock vole, and snowshoe hare.

Other rare mammals include the least weasel, fisher, northern flying squirrel, Keen's myotis (bat), eastern small-footed bat, Indiana bat, and Virginia big-eared bat.

The white-tailed deer and black bear are two particularly popular mammals. Approximately 80,000 hunters spend 820,000 days afield hunting on the Forest annually. Deer are the most sought after game species and are also a favorite non-game species. The Forest supplies a substantial portion of Virginia's public deer hunting lands. Twenty-four percent of Virginia hunters hunted on the Forest in 1991.

The black bear fills similar game and non-game roles In the eastern United States, the black bear occupies only a small fraction of its original range. The Forest provides a substantial portion of Virginia's black bear habitat

Habitat Management

Goals for habitat enhancement for a broad range of flora and fauna have been identified.

During the development of management plans for Special Interest Areas-Biological, it is estimated that between 100 acres and 300 acres per year may need to be treated to maintain or restore these areas to a natural state The primary treatment method is prescribed burning. Other treatments may include elimination, or control of exotic non-native species, selectively removing individual trees to increase sunlight to the understory, or felling individual trees to increase large woody debris in streams or to increase the amount of woody debris on the ground. Wide-scale removal of trees would only be used to remove an unnatural component.

In conjunction with heavily used developed and dispersed recreation areas, wildlife viewing opportunities can be increased by creating "viewing areas", and seeding or enhancing wildflower species that attract a variety of wildlife throughout the year.

Wildlife habitat improvements in recently purchased abandoned farm tracts include maintaining their open/brushy composition using a variety of methods including controlled burning or mowing, discing and seeding preferred wildlife food and cover plants, maintaining orchards, arbors, and/or planting new fruit bearing shrubs and trees Where applicable, small impoundments for waterfowl management and moist soil management areas for woodcock may be developed

Prescribed burning is an effective management tool to enhance a variety of habitats Burning helps maintain a shrubby, grassy condition for the New England cottontail, increases viewing opportunities, and improves aesthetics. Bear oak, a shrubby tree species, is a reliable mast producer until it reaches a stage where older individuals die unless it is rejuvenated and maintained by fire Prescribed burns can be used to eliminate much of the shrubby unproductive understory, such as mountain laurel, while maintaining the overstory tree component. A more open, grassy ground cover develops as a result of the fire and creates a much improved habitat condition for turkey brood range. Brood range is thought to be a limiting habitat factor for the turkey on this Forest (Virginia Department of Game and Inland Fisheries and the West Virginia Department of Natural Resources). Burning also stimulates blueberry and huckleberry growth and production. Burning can be used in some cases to maintain recently cleared areas in a grassy and shrubby condition Burning is also necessary for the maintenance of variable sedge, box huckleberry and fire maintained com-

munity types such as pine-oak-heath woodlands with pitch pine, table mountain pine, bear oak, and mountain laurel.

Many areas of the Forest were once small farms, but have now reverted to forest land. Maintenance of remaining fruit/shrub trees and associated small homesite openings makes excellent small wildlife management areas Sensitive species such as the loggerhead shrike and certain butterflies also benefit. Additionally, the Forest contains many similar small openings. They were created beginning in the Civilian Conservation Corps period of the 1930s and 1940s to date.

In areas where timber production is not practiced but wildlife habitat management is allowed, transitory openings may be made for the benefit of wildlife species that prefer remote habitats, but utilize clearings. Small areas may be cut and the timber left on the ground, or cut and the timber removed. Waterhole developments are effective in areas where free-flowing water is lacking. Development of waterholes in wetlands or springs does not take place. Their placement is determined on a case-by-case analysis

Overall, there is no shortage of cavity nest sites for wildlife and sites will increase due to the high mortality of oaks related to gypsy moth and oak decline. . Specific needs are in campgrounds and recreation areas where snags (hazard trees) are removed Nest boxes restore this habitat and provide "watchable wildlife" opportunities.

In open areas, bluebird boxes provide nesting sites for that species and also for wrens and tree swallows. Placed along rivers and reservoirs, wood duck boxes increase nesting opportunity and success. Large and small reservoirs are beginning to be colonized by Canada geese Geese take readily to artificial nesting platforms. These platforms create nesting habitat and increase survival rates

Effects of the Alternatives

Although **no alternative** completely prohibits manipulative wildlife habitat management, some place restrictions on the manipulation An estimate of the average annual amount of habitat manipulation for the alternatives is presented in Table 3-36.

Table 3-36.
Estimate of Annual Average Acres of Habitat Manipulation by Alternative

Alternative	Acres
2	500
3	100
4	100
5	500
6	5,400
7	6,100
8	3,400
8A	3,400
9	500
10	3,000
11	500
12	500
13	200
14	3,000

Biological Diversity

The most basic element of biodiversity is genetic variation. Genetic variation affects the physical traits of species, its productivity, resilience to stress, and long-term evolutionary potential Genetic diversity means that species contain natural levels of genetic variation within and among their populations.

A second, usually more recognizable aspect of biological diversity is distinct species. Some species, such as white-tailed deer, red-tailed hawk, and white oak are abundant and widespread. Others, such as Indiana bat, bald eagle, and swamp pink, face endangerment or even extinction. Species diversity means that an area contains its native species in numbers and distributions that contribute to both natural genetic variation and the likelihood of long-term continued existence throughout their geographic ranges

Associations of species in an area are a third component of biological diversity. We refer to these associations as biological communities or, when considered together with their non-living environment, ecosystems. They are usually recognized as distinct stands, patches, or sites, such as old-growth forests, riparian

areas, and wetlands. Communities form the biotic parts of ecosystems The variety of species in an area, referred to as its species composition, is intertwined with the structure of the ecosystem, and hence the diversity of ecological processes such as competition, predation, succession, nutrient cycling, and mutualism. Biologically diverse communities contain sufficient compositional, structural, and functional variety that they are assured a high prospect of continued presence and ecological influence in the area

Finally, at the geographic scale of regional landscapes, diversity includes a variety in the kinds of biological communities and a biogeography (patterns, sizes, shapes, juxtapositions and interconnectedness) that provides for free, natural interchange of individuals throughout the area. Many species, especially those with specialized habitat affinities or that are migratory or wide-ranging, can only be sustained in viable numbers and distributions in very large wildland areas, bioregions.

In examining the threats to the biodiversity of the George Washington National Forest planning area the best science and resource management will have minor lasting effects if social and political systems do not come to grips with human population growth, poverty, and pollution.

Old Growth

Old growth is a distinct condition of habitat (Martin, 1990; Robertson, 1989; Thomas, et. al., 1988; Parker,1989) found in all forest types. Typically, stands with old growth characteristics are found at the upper reaches of steep mountain drainages and contain a component of eastern hemlock. Other older age stands contain many old growth characteristics and may in fact be old growth But at this time, accepted quantifiable definitions of old growth have not been agreed upon for this Forest. This work is now underway and descriptions for old growth in all forest types east of the Mississippi River are expected to be finalized in 1993.

The Forest Inventory and Analysis (FIA) program currently supplies useful information about the landscape condition. The 1986 Forest Statistics for the Northern Mountains of Virginia and for the State of Virginia by Mark Brown (USDA Forest Service, Resource Bulletins SE-85 and SE-87) provide data indicating that since 1977 the region containing the Forest declined almost 4% in area of timberland but the area of timberland supporting stands more than 70 years old increased 16% Old forest conditions are uncommon statewide with less than 0.5% of all growing-stock trees greater than 19 inches in diameter and over 87% under 7 inches in diameter. In the region, while area of timberland is decreasing, the remaining timberland is getting older although this does not appear to be happening statewide However, it must be remembered that the age at which each forest type will develop old growth characteristics will vary. For example, yellow pine dominated types develop old growth characteristics at approximately 70 years and cove hardwoods at approximately 180 years.

Based on current forest inventory data and information available in the development of descriptions and definitions for old growth forests in the Eastern U S., the Forest now contains almost 180,000 acres in an old growth condition. Appendix H contains detailed information on old growth forests

The strategy for managing old growth forests includes a combination of old growth preservation and management to sustain or develop old growth characteristics for the future The best estimator of the potential of each alternative to develop old growth is the amount of forested land unavailable for harvesting in each alternative. Those amounts are shown in Table 3-38.

Alternatives 2, 4, 5, 7, 8, 9, 10, 11, 12, and 13 provide for the development of some old growth forests in each forest type. **Alternative 8A** protects existing old growth forests in all forest type groups with specific guidelines in old growth forest types 21.

Alternative 3, with no timber harvesting, has maximum potential for old growth development and retention. **Alternative 6**, with no timber target (ASQ), provides an amount comparable to **Alternative 3**. Refer to Table 3-37

Table 3-37.
Acres (by Thousands) of Old Growth, Determined by Management Area Prescription*

Alternative	Current	After 10 Years	After 50 Years
2	180	224	613
3	180	256	737
4	180	228	590
5	180	216	537
6	180	256	737
7	180	186	515
8	180	223	636
8A	180	225	614
9	180	200	681
10	180	238	647
11	180	162	611
12	180	223	572
13	180	204	651
14	180	229	622

* Amounts shown represent minimum acreage of potential old growth.

Fragmentation

The effects of fragmentation are species specific Plant and animal species have evolved because of fragmentation due to geologic or climatic changes. It is therefore not possible to present all fragmentation of habitat as either "good" or "bad" since it operates at varying scales on each species

Unfragmented habitat is a distinct condition of habitat. It is particularly important for neotropical birds, some of which require large tracts of undisturbed forest lands. A dependency of some neotropical birds on unfragmented habitats is related to the inability of the forest interior dependent species to reproduce successfully under edge conditions where predation, cowbird parasitism, and competition are high (Foreman et al., 1976; Howe and Jones, 1977; Whitcomb 1977; Lynch and Whitcomb, 1978; Robbins, 1979, 1980; Butcher et al., 1981; Whitcomb et al., 1981; Ambuel and Temple, 1983; Blake and Karr, 1984; Askins and Philbrick, 1987; Askins et al., 1987; Blake and Karr, 1987; Lynch 1987; Yahner and Scott, 1988) Roads, open or closed, can reduce the size of blocks of unfragmented habitat (Noss, 1987, Small and Hunter, 1988).

Forest fragmentation may occur in two ways First, forest fragmentation results from surrounding a forest community with other land uses, such as agriculture, urban development, or highway corridors. Second, forest fragmentation may result from isolating a forest community with forest management activities that surround the remaining forest area. This effect depends on the specific habitat needs of a species, and the area of habitat providing population viability

Management practices may result in forest fragmentation. Management that regulates a forest with long rotations and disperses young forest and old growth with replacement stands for the long term across the landscape provides opportunities for diverse habitats. These diverse habitats serve as linkages among communities and special habitats.

Forest fragmentation is a function of patch size, isolation of patches, total reserve area (sum of patches and contiguous forest), and habitat linkages among patches. Patch sizes relate to the amount and quality of available habitat Patch-size requirements vary by species Some neotropical migratory bird species, such as the black-throated warbler, require large areas of forested habitat. The patch size that supports breeding for this species is estimated to be about 2,560 acres A patch size that could support all of the Forests' breeding-bird communities is estimated to be about 7,680 acres Black bear require large areas and freedom from sustained disturbance of motorized vehicles and intensive timber harvest.

Several management areas do not allow commercial timber harvests (unsuitable acres). When of sufficient size, these management areas provide unfragmented habitats for area sensitive species. Table 3-38 displays by alternative

the percent of the Forest available and unavailable for timber harvests Table 3-39 displays the amount of "relatively fragmented" and "relatively unfragmented" lands in each alternative.

Many species tolerate or prefer a mixture of age classes, but some species are restricted to young- or mature-forest communities only. Isolation often results in a species not being able to find and use the patch or permanent changes in species composition and community structure. Isolation may result from land-ownership patterns. Black bear is an example of a species that benefits from a variety of age classes but may be isolated from them due to development of private lands and major road corridors. The total reserve area is the sum of the small and large tracts of forest that are available as habitats A large, contiguous forest area has the highest probability of supporting most or all of the associated plant and animal species Maintaining populations of native and desirable non-native plants and animals across the Forest requires managing for the least common and most habitat-specific species. Habitat linkages are necessary to connect areas of suitable habitat for all species Examples of habitat linkages are riparian areas, linear ridges and mountain tops, and areas of middle-aged and mature forest that link old-growth areas.

Patch sizes created by uneven-aged management may be too small for most species. Some species that may use these small patches are deer, rufous-sided towhee, and other early successional songbirds, small mammals, and reptiles. Disturbance created by uneven-aged management, which operates over larger areas and for longer periods than even-aged or two-aged methods, may adversely affect habitat for species that require hard mast and freedom from disturbance. If harvests between small openings result in less than 60 basal area in a species that produces hard mast, suitable habitat for species dependent on hard mast, such as black bear and white-tailed deer, will be decreased or eliminated and may adversely affect population viability in localized areas Populations of eastern wild turkey and black bear may decline in uneven-aged management areas that are currently suitable habitat.

Edge effects occur when forest edges are created by harvest or other activities. Species composition and community structure may change areas where light and wind can extend into the exposed forest edge. This creates suitable habitat for some species and unsuitable habitat for others. Some species that nest in interior forests may be subject to nest predation by species attracted to forest edges. This effect may extend from about 240 to 300 feet within a community. Nest predation is usually associated with forest edges that are adjacent or closest to agricultural and other open habitats. When forest management is conducted in large forested tracts, this predation does not seem to occur, but the question is being studied.

Early seral forest stages, edge, and a variety of age classes interspersed in a mosaic pattern is the preferred habitat for a variety of species -- particularly game animals (Virginia Game Commission, 1963; National Rifle Association, 1963) Roads, opened or closed, provide for linear grassed strips within a forest setting and create an edge effect.

The presence of early successional habitats on a landscape that is predominately forested does not necessarily preclude the presence of species that require late successional vegetation. The vegetation matrix composed of both late and early successional forests increases both the local and regional diversity of breeding birds.

Total acreages that provide early seral forest stages, late seral forest stages, and minimal disturbance were calculated (Table 3-38)

Table 3-38.
Measurable Habitat Attributes and Quantities by Alternative

Habitat Attribute	Alternative													
(acres are rounded to nearest thousand)	2	3	4	5	6	7	8	8A	9	10	11	12	13	14
Land unavailable for timber harvesting (M Acres)	762	1,061	707	407	1,061	366	801	713	995	941	781	466	876	711
Land unavailable for timber harvesting (Percentage)	72%	100%	67%	38%	100%	34%	75%	67%	94%	89%	74%	44%	83%	67%
Land available for timber harvesting (M Acres)	300	0	354	654	0	696	260	348	65	120	280	595	185	350
Land available for timber harvesting (Percentage)	28%	0	33%	62%	0	66%	25%	33%	6%	11%	26%	56%	17%	33%
Early successional habitat[1] - Annually (M Acres)	2	0	3	4	0	4	2	2	5	9	2	3	1	2
Early successional habitat[1] - Annually (Percentage)	2%	0	2%	3%	0	4%	02%	02%	05%	08%	01%	3%	02%	27%
Early succcessional habitat[1] - 1st Period - Cumulative (M Acres)	24	0	28	40	0	41	19	24	6	9	17	33	14	23
Early successional habitat[1] - 1st Period - Cumulative (Percentage)	2%	0	2%	3%	0	4%	1 5%	2%	5%	8%	1%	3%	1%	2%
Average size of opening in acres (even-age management)	15	0	32	32	0	20	22	17	0	32	20	22	10	17

[1]Created as a result of the timber program (0-10 age class)

Management Indicator Species

Management Indicator Species (MIS) for the Forest were selected in accordance with Section 219.19(a) of NFMA regulations and include: 1) endangered, threatened, sensitive species; 2) species whose habitats may be influenced by management; 3) species commonly hunted, 4) non-game of special interest, and 5) species whose population changes are believed to indicate the effects of management activities on other species or selected major biological communities.

MIS include· black bear, wild turkey, white-tailed deer, common flicker, pileated woodpecker, brown-headed cowbird, ovenbird, worm-eating warbler, cave dwelling bats, Cow Knob salamander, tiger salamander, yellow pines, old growth forest types, brook trout and sunfish (see FISHERIES section), and all species federally listed as threatened or endangered and known to occur on the Forest (northeastern bulrush, swamp pink, smooth rockcress, James spiny-mussel, peregrine falcon, bald eagle, Virginia northern flying squirrel, Indiana bat) Refer to Appendix J, *Legal Requirements for Diversity and Rationale for Selection of Management Indicator Species (MIS)*

Area sensitive Management Indicator Species include the worm-eating warbler, and ovenbird Estimated acreage of unfragmented habitat needed to maintain optimum populations of area sensitive neotropical migrants is 7,400+ acres (Robbins, et al , 1989)

Suggested minimum area requirements to maintain the presence of these species are 15 acres for the ovenbird, 370 acres for the worm-eating warbler, and 400 acres for the pileated woodpecker (Robbins et al , 1989)

The pileated woodpecker is a cavity nester, and depends on an older age forest for its existence. Conner (1978) recommends a rotation age of 150 years to optimize its habitats in managed forest lands The worm-eating warbler favors second-growth woodlands with a dense understory. The ovenbird prefers mature hardwoods with a closed canopy (DeGraff, 1986) Optimum habitat is provided for these species in roadless lands and other lands classified as unsuitable for timber production. Lands with controlled road densities also provide quality habitat for these species. Lands with low road densities and long rotation ages also provide good habitat

All alternatives provide large quantities of habitat for these species. **Alternative 3** provides the highest quantity and quality habitat for these species **Alternative 3** does not allow timber harvesting or new development in approximately 99 percent of the Forest. The result in virtually all of the Forest is the development of habitat for species that require remote habitats and/or old-age forest conditions **Alternative 5** provides the least amount of these habitats, but still provides for some old-age forest conditions.

Table 3-39 displays the amount of "relatively fragmented" and "relatively unfragmented" habitat for each alternative.

"Relatively unfragmented" habitat is defined by those management areas or portions of management areas where relatively little or light on the land vegetative manipulation occurs and have a management policy that precludes road construction or public vehicular access.

"Relatively fragmented" habitat is defined by those management areas or portions of management areas or include a desired future condition that encourages public vehicular access.

Table 3-39.
Amount of "Relatively Fragmented" and "Relatively Unfragmented" Habitat by Alternative

Alternative	Relatively Fragmented Habitat	Relatively Unfragmented Habitat
	Thousands of Acres	
2	535	526
3	10	1051
4	944	117
5	935	128
6	127	934
7	762	299
8	444	617
8A	458	603
9	109	952
10	179	882
11	389	672
12	735	326
13	341	720
14	511	550

Table mountain pine (*Pinus pungens*), pitch pine (*Pinus rigida*), shorleaf pine (*Pinus echinata*), and Virginia pine (*Pinus virginiana*) are collectively called yellow pines. These pines dominate approximately 250,000, or one-fourth, of the forested acres on the Forest. Recent evidence suggests that forests dominated by yellow pines may be declining in the region as a result of human-

altered disturbance regimes, particularly fire suppression (Williams, 1991). Fire is critical to the maintenance of yellow pines and associated plants and animals in parts of the landscape. Without fire, these pine dominated communities will decline in quality and acreage due to succession and eventual replacement by mixed oak-pine or oak dominated forests **Alternatives 2, 4, 5, 7, 8, 8A, 9, 10, 11, 12 and 13** allow for prescribed fire for the restoration and maintenance of yellow pine dominated natural communities. Under **Alternative 3**, which does not allow prescribed fire, yellow pine communities which occur on more mesic sites will in time be replaced by oak-pine or oak dominated forest with a decrease in habitat for fire dependent species.

Area size requirements for the Cow Knob salamander are unknown. It prefers undisturbed, older age class forested areas (Buhlmann et al , unpublished). The majority of range for this endemic species lies within a Wilderness Study Area in **Alternative 3. Alternatives 6, 8A, 11, and 13** allocate most of the range of this salamander (above 3000 feet elevation on Shenandoah Mountain) to a Special Interest Area-Biological specifically for this species Any acreage not allocated to Management Area 4 in these alternatives is allocated to Management Areas 8 or 21. **All other alternatives** allocate most Cow Knob salamander range to Special Interest Areas-Biological, Remote Highlands, or to Management Area 14

The tiger salamander is known to occur in seasonally dry sinkhole ponds. It is listed as a state endangered species by Virginia. The occurrence of this species on the Forest represents the only known occurrence in the Mid-Appalachian Mountains. Most occurrences are on the Atlantic Coastal Plain or Mississippi River Valley. This salamander breeds in ponds in late winter or early spring, then disperses to terrestrial burrows up to 800 feet from the pond (Pague and Buhlmann, 1991). Under all Alternatives except 7, the known range of this species on the Forest is in Management Area 4. In Alternative 7, the occurrences are in Management Area 15 where standards may not provide for the continued viability of the species

Old growth is a distinct condition of habitat found in all forest types. It's designation as a management indicator reflects the importance of this condition in providing habitat for species which require spatial and structural attributes which only old age forest stands can provide. Further discussion and effects can be found in the "Old Growth" section under the discussion on Biological Diversity and Appendix H in the Final EIS.

Management Indicators that prefer early successional forested areas, edge, and a mosaic of forest age classes include the white-tailed deer (Halls, 1984; Downey 1987); wild turkey (Coggins, 1975, Wunz, 1989); common flicker (DeGraff, 1986), and brown-headed cowbird (Hamel, et al., 1982). Increased forest (timber) management and addition of edge effect created by increased

mileages of roads benefit the flicker and the cowbird (Brittingham, 1989; Flamm, 1990). Brown-headed cowbird is a nest parasite of songbirds and will serve as an indicator of edge habitat effects. The ideal rotation age for deer habitat is 100 years and for wild turkey habitat, 135 years, as recommended for this Forest by the Virginia Department of Game and Inland Fisheries and the West Virginia Department of Natural Resources. Table 3-38 displays the amount of land in each alternative that is harvested and creates early successional stages of vegetation **Alternative 5** provides the most early successional habitat; **Alternative 3** provides the least. **All alternatives** provide small quantities of this habitat type See Table 3-38.

The black bear is an opportunistic species that can thrive in a variety of habitats (Hillman, 1986). Access management (freedom from constant disturbance) is considered the most important habitat need (Lentz, 1980, Carlock et al , 1983, Hamilton and Marchinton, 1980, Miller, 1975; Pelton, 1980; Brody, 1984). Closed and seeded roads do not inhibit bear movement and can improve habitat quality (Brody, 1984, Jenkel and Cowan, 1971). In managed hardwood lands, rotation ages exceeding one hundred years are recommended (Hillman, 1986). For the George Washington National Forest, the Virginia Department of Game and Inland Fisheries and the West Virginia Department of Natural Resources recommend an average rotation age of 135 years.

Key elements of each species' habitat are contained in Table 3-38 and estimated carrying capacities of habitat for bear, wild turkey, and white-tailed deer are in Table 3-40.

Table 3-40.
By Alternative, Forestwide Carrying Capacity[1] of Habitat for Bear, Turkey, and Deer

Alternative	Bear	Turkey	Deer	Comparison: Ranking Positions Bear/Turkey/Deer
2	1,300	16,600	40,300	10/9/8
3	1,500	15,600	26,600	1/12/14
4	700	8,600	30,800	14/14/12
5	900	14,900	60,700	13/13/2
6	1,500	21,600	46,400	1/2/5
7	1,400	24,200	64,100	4/1/1
8	1,400	18,900	41,400	4/5/7
8A[2]	1,400	19,800	46,400	4/3/5
9	1,500	16,200	28,600	1/10/13
10	1,400	16,100	34,200	4/11/10
11	1,400	18,900	38,000	4/5/9
12	1,200	19,300	56,600	12/4/3
13	1,400	17,500	33,100	4/8/11
14	1,300	18,200	46,600	10/7/4

[1]Carrying capacity means the number of animals the Forest can support with the habitat provided
[2]Forest Service preferred alternative

Cave-inhabiting bats are equally protected in **all alternatives.** Forestwide *Standards protect caves and a buffer zone around cave entrances in* ***all alternatives*** One cave and the surrounding forest lands are classified as a Special Interest Area-Biological. The cave is closed to recreational use during the fall, winter, and spring hibernating season.

All alternatives meet the standards for maintaining at least minimum viable populations of Management Indicators See process paper *Incorporation of the NFMA Requirements for Diversity into the Revision of the Land and Resource Management Plan for the George Washington Forest* and Table 3-40.

Estimated Demand

The Forest provides over half of the public lands open to hunting in Virginia. Approximately 20 percent of Virginia's hunters hunted on the Forest in 1991. Public demand for game and game habitat management remains high on this Forest despite a general nationwide downward trend in hunting. Big game hunting on the Forest increased 21 percent between 1980 and 1987. The species most commonly hunted include deer, turkey, squirrel, grouse, and bear. Significant increases are projected in the demand analyses for future years See Table 3-41.

Table 3-41.
Estimated Demand in Thousands of User Days for Wildlife Viewing, Fishing and Hunting (Annually for Decade 1)

Category/Demand	Category/Demand	Category/Demand
Wildlife Viewing: 285	Fishing 191 (cold water 80%) (cool/warm 20%)	Hunting: 477 (big game 74%) (small game 26%) (waterfowl <1%)
Total: 953		

Wildlife Viewing. All alternatives are expected to meet demand.

Fishing. Alternative 3 eliminates the put-and-take fisheries program which accounts for 72 percent of the fishing on the Forest. This results in a similar drop in user days. For all other alternatives, there are no significant changes in the fisheries program direction or resource protection. Therefore, it is estimated that these alternatives provide the same supply as current (139,260 user days/ annually) level. This represents 80 percent of estimated demand

Hunting. Big game hunting is estimated to account for 74 percent, and small game (primarily squirrel and grouse) for 26 percent of the estimated total demand.

Black bear, wild turkey, and white-tailed deer are the three big game species inhabiting the Forest An estimate of the supply provided by each alternative is presented in Table 3-42.

Table 3-42.
Supply (as a percent of demand) for Bear, Turkey, and Deer

Alternative	Bear	Turkey	Deer	Total
2	157%	81%	73%	82%
3	177%	76%	48%	67%
4	79%	42%	56%	53%
5	109%	73%	110%	99%
6	177%	105%	84%	98%
7	166%	118%	116%	121%
8	169%	92%	75%	87%
8A	166%	96%	84%	94%
9	175%	79%	52%	70%
10	165%	79%	62%	75%
11	173%	92%	69%	84%
12	144%	94%	102%	103%
13	171%	85%	60%	76%
14	159%	89%	84%	92%

Table 3-43.
Ranking Comparison Among Alternatives

Rankings: Descending Order		Alternatives Bear	Turkey	Deer	Overall
highest	#1	3/6	7	7	7
	#2	–	6	5	12
	#3	9	8A	12	5
	#4	11	12	6/8A/14	6
	#5	13	8/11	–	8A
	#6	8	–	–	14
	#7	7/8A	14	8	8
	#8	–	13	2	11
	#9	10	2	11	2
	#10	14	9/10	10	13
	#11	2	–	13	10
	#12	12	3	4	9
	#13	5	5	9	3
lowest	#14	4	4	3	4

Squirrel (primarily gray), and ruffed grouse are the two small game species most commonly hunted on the Forest. Habitat for squirrel on this Forest is best judged by the age of the forest Grouse depend on early seral forest stages and quality habitat is a result of active forest management. Habitat for grouse on this Forest is best judged by the amount of land in early forest successional stages

It is estimated that all alternatives allocate enough habitat to meet the demand for squirrel hunting Alternatives that allocate the most acres to timber harvests also allocate the most grouse habitat (Table 3-29). Habitat (old field conditions/ hedgerows) for bobwhite quail and cottontail rabbit are generally lacking on this Forest

Threatened, Endangered, Sensitive Species

The Forest, located in both the middle section of the Appalachian Mountains in both the Blue Ridge and Ridge and Valley Provinces supports a rich and diverse assemblage of flora and fauna

Scientists concur that one of the most significant values and contributions of the Forest to society is the habitat provided for threatened, endangered, and sensitive plant and animal species. The Forest contains, or is within the range of, at least 243 of these rare species that warrant special protection Species included are 156 plants, 29 invertebrates, 7 mollusks, 3 fish, 2 amphibians, 6 reptiles, 24 birds and 16 mammals (refer to Appendix F). This list is based on the best available current information. As new information becomes available, the list will be updated and changed

The present distribution of 10 plants and animals listed as threatened or endangered by the USDI Fish and Wildlife Service under provisions of the Endangered Species Act include lands managed by the Forest. These include 3 plants and 7 animals as listed in Appendix F. The Forest contains no critical habitat, as defined by the USDI Fish and Wildlife Service and presented in species recovery plans, for federally listed species inhabiting this Forest. It is law and policy that habitats for species in this category be maintained and enhanced This includes occurrences of these species wherever they are found on the Forest as well as those found within Special Interest Areas-Biological. All alternatives comply with the Endangered Species Act by protecting and assisting with recovery efforts. See Forest Appendix J *Legal Requirements for Diversity and Rationale for Selection of Management Indicator Species (MIS)* and Forest Service Manual 2670.

Special Interest Areas-Biological (Exemplary Plant & Animal Communities)

Each alternative provides for protection of habitat for threatened, endangered, and sensitive species. Special Interest Areas-Biological are the keystone to their protection. Special Interest Areas-Biological also provide a solid foundation for maintaining biological diversity on the Forest.

The alternatives allocate differing amounts of lands to Special Interest Areas-Biological. Table 3-44 displays the amount of land allocated to biological special interest areas in the alternatives

Table 3-44.
Thousands of Acres Allocated to Special Interest Areas-Biological by Alternative

Alternative	Thousands of Acres
2	54
3	11
4	53
5	53
6	84
7	2
8	54
8A	70
9	34
10	53
11	31
12	53
13	51
14	54

Special Interest Areas-Biological contain unusual habitat types that support a variety of exemplary natural communities Of particular importance on this Forest are shale barrens, high elevation mountaintops, wetlands, and naturally occurring woodland glades

Shale barrens are located on Devonian age shales, usually with a south aspect and undercut by a stream. Shale barrens are sparsely vegetated but contain a number of endemic plant species and an unknown number of dependent insect species. The Forest contains more acres of shale barrens than any other group of lands in public or private ownership.

Mountain tops, cliffs, and associated rock outcrops contain distinctive flora These areas provide the only habitat for several species of plants and animals that are very rare in Virginia and West Virginia The global range for the endemic Cow Knob salamander is located along the crest of Shenandoah Mountain from Cow Knob south to the Little Bald Knob

Mountain wetlands are rare community types in this region and support many threatened, endangered and sensitive species. Wetlands include distinctive stream-side vegetation, naturally occurring ponds, springs, seeps, bogs, and seasonally dry sinkhole ponds

Woodland glades provide habitat for a distinctive flora, particularly for species that prefer an open, park-like habitat dominated by grasses and sedges.

All but a few of the listed threatened, endangered, or sensitive species are represented in Special Interest Areas-Biological or caves Others, such as the bald eagle, have site-specific guidelines.

The following species are found in areas, other than Special Interest Areas-Biological, that are treated similarly in **all alternatives** with adequate protection provided. American beakgrain is located within an existing wilderness area Bristly black current inhabits a portion of a developed recreation area. Bristly sasparilla inhabits open (mowed) areas around an electronic site. Canby's mountain-lover blue false indigo, slender spikerush, rock goldenrod and false starflower are located within river corridors managed to meet requirements of the Wild and Scenic Rivers Act of 1968 Silky dogwood, whitewater crowfoot, wood turtle, orangefin madtom, Potomac sculpin, roughhead shiner, Atlantic pigtoe, brook floater, and James spinymussle reside in designated riparian areas.

Only a few species have know occurrences in areas where management areas change by alternative. The preferred alternative will ensure that the management allocated to the area inhabited by these species provides adequate protection and allows for appropriate species specific management in order to recover and maintain these species.

Table 3-45 lists each Special Interest Areas-Biological by Ranger District, size, and primary habitat

Table 3-45.
Special Interest Areas-Biological: Location, Size, and Primary Habitat Maintained

District	Name	Acreage	Habitat	District	Name	Acreage	Habitat
Deerfield	Blackies Hollow	142	SB	James River	Brattons Run	119	SB
Deerfield	Clayton Mill Spring	37	WL	James River	Dry Run	2075	SB
Deerfield	Elliott Knob	1024	MT	James River	Dabney S Lancaster	66	SB
Deerfield	Headwaters	94	SB	James River	Craig Creek	101	SB
Deerfield	Reubens Draft	39	SB	James River	East Sharon	433	SB
Deerfield	Sister Knob	1252	SB	James River	Gauging Station	46	SB
				James River	Potts Pond	56	WL
Dry River	Brandywine	43	SB				
Dry River	Camp Run Prairie	163	WG	Pedlar	Big Levels	12145	MT
Dry River	Shenandoah Mountain	53214[1]	MT	Pedlar	Little Irish Creek	38	OG
				Pedlar	Loves Run Ponds	463	WL
Lee	Big Schloss	476	MT	Pedlar	Maple Flats	682	WL
Lee	Brown's Hollow	1089	SB	Pedlar	Pines Chapel Ponds	204	WL
Lee	Buck Mountain	1243	SS	Pedlar	Staton's Creek	55	OG
Lee	Edinburg Gap	310	SB				
Lee	Mudhole Bog	115	WL	Warm Springs	Bald Knob	93	MT
Lee	Peters Mill Run Bog	480	WL	Warm Springs	Brown's Pond	117	WL
Lee	Salus Spring	303	WL	Warm Springs	House Hollow	977	SS
Lee	Scothorn Gap	34	SB	Warm Springs	Laurel Fork	6172	WL
Lee	Signal Knob	223	SB	Warm Springs	Millboro Tunnel	201	SB
Lee	Teets Bog	31	WL	Warm Springs	Paddy Knob	1709	MT
Lee	Trout Pond	1	WL	Warm Springs	Rough Mountain[2]	2191	SB
Lee	Twin Blackwater Ponds	16	WL				
Lee	Vance's Cove	90	WL				

TOTAL 88,000 Acres in 42 Special Interest Areas-Biological

CV=Cave, MT=Mountaintop, OG=Old Growth, SB=Shale Barren, SS=Single Species, WG=Woodland Glade, WL=Wetland
[1]Includes the Little Laurel Run Research Natural Area
[2]All of this Special Interest Area-Biological is within a designated wilderness

In addition to Special Interest Areas-Biological, two Research Natural Areas (RNA) have been established on the Forest They are maintained in a natural state for research and educational purposes. Forest types represented are eastern white pine (SAF 21), eastern hemlock (SAF 23), bear oak (SAF 43), chestnut oak (SAF 44), pitch pine (SAF 45), and yellow poplar-white oak-northern red oak (SAF 59)

Little Laurel Run RNA, established in 1938, contains 2,000 acres on the Dry River Ranger District. Ramseys Draft RNA, established in 1935, is now located inside Ramseys Draft Wilderness, and contains 1,700 acres on the Deerfield Ranger District

Six areas are identified as candidates for consideration and possible designation as Research Natural Areas pending additional review and study These areas are Big Levels (12,000 acres), Laurel Run (3,400 acres), Maple Flats (1,400 acres), Shale Barren(s) (5,000 acres), Skidmore (2,300 acres), and Slabcamp/Bearwallow (2,800 acres). **All alternatives**, with the exception of **Alternative 3**, classify these areas as Special Interest Areas-Biological **Alternative 3** classifies these areas as either Wilderness Study Areas or Special Interest Areas-Biological.

The Forest has 22 known caves. Bats inhabit 17 of them Other caves may contain sensitive species such as the eastern woodrat and a variety of invertebrates Protective standards for caves (see *Forestwide Standards* in Chapter 2 of the Revised Forest Plan) have been adopted in **all alternatives** and provide ample protection for cave-dwelling species

Species requiring mixed grassland and shrubby open/brushy habitat include the loggerhead shrike, snowshoe hare, and rare butterflies such as the regal fritillary **All alternatives** allow habitat manipulation in order to maintain habitats for these and other threatened, endangered, or sensitive species

Appendix F of this document lists each threatened, endangered, or sensitive species known to occur or likely to occur on this Forest based on the best available information.

Appendix K is the Biological Assessment and Biological Evaluation disclosing the effects of implementing the Revised Plan on federally listed threatened and endangered species and sensitive species, respectively.

CHAPTER 4

LIST OF PREPARERS

INTRODUCTION

Biographical sketches follow of the major preparers of the draft and final version of the Environmental Impact Statement and the Revised Forest Plan.

THE INTERDISCIPLINARY TEAM

Ronald W. Lindenboom -- Team Leader

Ron has a bachelor's degree in botany from Drew University (1966) and a master's degree in forest pathology from Duke University (1967). He has worked for 20-plus years with the U.S. Forest Service on four ranger districts, in two forest supervisor's offices and in the Southern Regional Office.

Ron served five years as a planner on the Francis Marion and Sumter National Forests where he was heavily involved in the preparation of two forest plans. He also served five years as a planner in the Land Management Planning Group of the Southern Region.

Ron is an experienced planner who has participated in all phases of the land and resource management planning process. He is also knowledgeable in NEPA procedures.

John Cleeves -- Planning Analyst

John has a bachelor's degree in forest management (1974) and a master's degree in operations research and planning (1976) from Colorado State University He has worked 16 years with the U.S. Forest Service in four forest supervisor's offices located in the Northern, the Intermountain, the Pacific Southwest and the Southern regions

John began his career on the Unita National Forest in Utah as an operations research analyst developing goal and linear programming models to aid in forest planning. From Utah, he moved to Idaho's Clearwater National Forest and for eight years acted as the operations research analyst in developing a computer model for the forest plan. Then in 1987, John transferred to the Shasta-Trinity National Forest in northern California, accepting a job as an economist and operations research analyst. His duties involved aiding the Forest in redoing the Draft Environmental Impact Statement for the Forest Plan. In 1990 John transferred to the GWNF accepting a job as a planning analyst.

John has a wide breadth of experience in applying analytical techniques to forest planning problems. He has given many presentations to special interest groups to explain the value of these techniques.

Richard D. Patton -- Hydrologist

Richard has a bachelor's degree in history from Emory University (1969), a master's degree for teachers in history from Georgia State University (1973), and a master's degree in forest management, concentrating in hydrology, from the University of Georgia (1980). He has been a hydrologist with the U S Forest Service for 12 years, serving on one ranger district and in two forest supervisor's offices

Richard helped with several aspects of the Forest Plan while working on the GWNF from 1980 to 1985 He gained further knowledge of NEPA procedures while serving on an interdisciplinary team for a wild and scenic river study on the Ozark-St. Francis National Forests In April 1990, he returned to the George Washington

Robert Glasgow -- Wildlife Biologist

Bob earned a bachelor's degree in forestry (1975) and a master's in wildlife management (1978) with minors in wildlife and botany from Louisiana State University. He worked eight summers as a seasonal forest firefighter, wildlife technician, and park ranger for the U.S. Forest Service, the U.S. Fish and Wildlife Service, and for the National Park Service throughout the West.

Bob was permanently employed by the U.S Fish and Wildlife Service as Asst Refuge Manager at St. Marks National Wildlife Refuge in Florida and as Refuge Manager of Pinckney Island National Wildlife Refuge in South Carolina.

For the past 12 years, he has worked with the U.S. Forest Service as a district wildlife biologist, an assistant district ranger in the Rocky Mountain Region, and for five of those years, as forest wildlife biologist for the GWNF

Recently, Bob has accepted a job as a fisheries, wildlife and range staff officer on the National Forests in Mississippi.

In all positions with the U S Forest Service, Bob has been involved in forest planning

Steve Sherwood -- Assistant Recreation Staff Officer

Educated at Colorado State University, Steve has a bachelor's degree in forest management science (1977) and a master's degree in economics (1980). He has more than 11 years of experience with the U.S. Forest Service and has worked in a number of positions ranging from forest technician to ranger district resource assistant to project director for the Florida National Scenic Trail.

Recently, Steve has accepted a job as district ranger on the Mount Rogers N.R.A. within the Jefferson National Forest.

Steve's land management planning experience includes a one-year assignment as the forest economist in the Deschutes National Forest in Oregon and a three-year assignment as the operations research analyst for the National Forests in Florida.

Geoff Laidman -- Forester

Geoff has a bachelor's degree in forestry from the State University of New York and Syracuse University. He majored in forestry land management. After two years on active duty with the U.S. Army Corps of Engineers, Geoff began his career with the U.S. Forest Service. He has over 24 years of experience on three national forests in the Southern Region

His experience began at the ranger district level on the Jefferson National Forest and consisted of all facets of resource management. An assignment as timber management assistant on Arkansas' Ouachita National Forest for two years was followed by another district assignment as land use assistant on the George Washington National Forest. During the work on the districts, Geoff was heavily involved in compartment examination and prescription duties

Since 1978, Geoff has held the sales forester position in the GWNF Supervisor's Office. As sales forester, he provides staff assistance to the timber staff officer and to district personnel in planning and accomplishing timber sales on the Forest.

Jane Singleton -- Writer/Editor

Jane has a bachelor's degree in journalism with a minor in English from Eastern Kentucky University With the Forest Service since 1980, Jane has served as writer/editor with the Daniel Boone and the Boise national forests before transferring to the George Washington as a public affairs specialist and writer/editor on the ID Team.

Other experience includes writing for a fire recovery planning team and serving as newspaper staff writer and free-lance writer

Steve Croy -- Botanist/Ecologist

Steve earned a bachelor's degree from the University of Montana with a double major in botany and wildlife biology He completed the initial rare plant survey on the George Washington National Forest 10 years ago while a research assistant at Virginia Tech. He was director of the Virginia Natural Heritage Program from 1981-1985 and director of Preserve Selection and Design with the Virginia Chapter of the Nature Conservancy in 1986.

Prior to Steve's job on the GW, where he started in October 1991, he was a botanist with the National Forests in North Carolina.

Mark Hudy -- Fisheries Biologist

Mark has a bachelor's degree in fisheries from Virginia Tech (1978) and a master's degree in fisheries from Utah State (1980). He is a Certified Fisheries Scientist (American Fisheries Society 1982). Mark worked for several state agencies and universities on aquatic ecosystems in the southeast; participated in the initial Virginia trout stream surveys; and previously held the forest fisheries biologist position on the Francis Marion & Sumter National Forests in South Carolina

Scott R. Klinger -- Wildlife Biologist

Scott has a bachelor's degree in forest biology from Pennsylvania State University (1977) and a master's degree in wildlife ecology from Kansas State University (1983). Scott worked as wildlife biologist, fish and wildlife administrator, and forester (administration) with the U.S. Army in Kansas for 10 years. In 1989, he transferred to Atlanta, Georgia, to administer the U S. Army Forces Command Regional Natural Resources Programs on 4,500,000 acres Prior to joining the George Washington National Forest as forest wildlife biologist in November 1992, Scott served as the regional wildlife planning biologist for the Southern Region of the U.S. Forest Service in Atlanta, Georgia.

Lance P. Brady -- Engineer

Lance's formal education includes bachelor's degrees in business administration and civil engineering. For the past nine years, he has worked for the U.S. Forest Service in the Rocky Mountain, the Southwestern, and the Southern regions All positions were at forest supervisor's offices. He is licensed as a Professional Engineer in the Commonwealth of Virginia.

Prior to the Forest Service, Lance was employed by a private engineering firm for two years Lance's experience with the Forest Service has been in transportation planning, route location, survey and design, and also facilities planning, design and inspection. He has served on many interdisciplinary teams for timber sale planning.

Jeffrey J. Witcosky -- Entomologist

Jeff has a bachelor's degree in biology from Humboldt State University (1975) and master's and doctorate degrees in forest entomology from Oregon State University (1982, 1985). He has been with the U.S. Forest Service for eight years and has worked at the Forest Pest Management Field Office in Pineville, Louisiana, and at the George Washington National Forest Supervisor's Office.

Michael A. Linden -- Geologist

Michael received his bachelor of science degree in geological sciences from the State University of New York at Stony Brook in 1978. In 1981, he received his master of science degree in economic geology from Virginia Polytechnic Institute and State University.

Michael has worked for industry (Chevron Resources Company, 1981-1982) doing "hardrock" minerals exploration in the southeastern United States. From 1982 to the present, Michael has worked as a geologist for the U. S. Forest Service. He has served at both the regional office and supervisor's office levels. Recently, Michael has been teaching geology at a local community college.

Since 1984 when he became the Jefferson National Forest geologist, Michael has worked on NEPA documentation and planning for mineral resources at the forest-level. Michael took the lead role in developing the minerals section of the Forest Plan and the Environmental Impact Statement for the Jefferson NF. In 1988, Michael acquired the shared-services geologist position for both the George Washington and the Jefferson national forests.

Thomas K. Collins -- Geologist

Tom has a bachelors degree in geology from the City University of New York (1965) and several years of graduate study in geology from U.C.L.A.

Tom has more than 20 years experience on several National Forests throughout the U S. in fields such as environmental geology, engineering geology, energy and minerals geology, and groundwater geology. He has more than 12 year experience integrating energy, mineral and geologic resources in Forest Plans in different environments. Tom has also conducted site-specific investigations

for hundreds of projects, ranging from geologic hazard analysis for timber sales and recreation facilities to development and reclamation plans for oil and gas and mining projects.

Tom filled the shared-services geologist position for both the George Washington and Jefferson National Forests vacated by Michael Linden in December 1991.

Kenneth G. Landgraf -- Hydrologist

Ken has a bachelor's degree in water resources and biology from the University of Wisconsin - Stevens Point (1977). He has worked for 14 years in the U.S. Forest Service on three National Forests.

Ken began as a hydrologist on the Hiawatha National Forest in the upper peninsula of Michigan He then moved to the George Washington National Forest where he was the forest hydrologist for 7 years. For the past 5 years, Ken has been in an interdisciplinary position on the Jefferson National Forest with responsibility for the soil, water and air programs.

Thomas E. Wright, Jr. -- Landscape Architect

Tom has a master's degree in landscape architecture from Louisiana State University (1978) and a bachelor's degree in business from McNeese State University (1971). He has been with the U S Forest Service for 13 years, having worked on the Ouachita National Forest in Arkansas and Oklahoma before coming to the George Washington in 1983.

Tom's primary duties have included recreation planning and design, recreation management and visual resource management.

Gerard Jacques -- Lands/Fire/Minerals Staff Officer

Gerry has a bachelor's degree in forestry from the University of Maine and has 34 years of U.S. Forest Service experience He has served in three national forests and has supplied lands, fire and minerals input for the forest planning process

Virginia Flanagan -- Landscape Architect Trainee

Virginia Flanagan received her Bachelor of Landscape Architecture degree from Virginia Polytechnic Institute & State University in 1990. Her concentration as a student was on rural landscapes and design of linear parks and corridors She was employed by the College of Architecture and Urban Studies Commu-

nity Design Assistance Center in 1989 and 1990, and joined the Supervisor's Office of the George Washington National Forest in July 1990

While a student, Virginia worked on development plans and designs for the Craig County Scenic Trail, Jackson River Scenic Trail, and Highlands Scenic Tour. While with the Supervisor's Office she has worked with the Forest Archeologist in developing the Interpretive Master Plan for the Forest and has been involved in visual resources inventory mapping.

Jeff H. Rettig -- Forest Botanist

Jeff has a bachelor's degree in botany (1977) and a master's degree in biology (1979) from Arkansas State University and a Ph.D. from the University of Georgia (1988). He was a rare plant botanist for the Arkansas Natural Heritage Commission.

Jeff also worked as an Assistant Research Scientist at Texas A & M University before joining the Ozark National Forest as a botanist in July 1990 Jeff became the George Washington National Forest's first botanist in February 1991

Richard W. Standage -- Forest Fisheries Biologist

Richard has a bachelor's degree in fisheries management from Utah State University (1973) and is a Certified Fisheries Scientist (American Fisheries Society - 1978) He has worked more than 12 years with the U.S. Forest Service on three national forests in the Pacific Southwest and Southern regions

Prior to working for the Forest Service, he worked for two state fish and game agencies, the U S Fish and Wildlife Service and a state water quality agency. The water quality position was as project leader for a state-wide study on non-point source water quality impacts on fish and wildlife.

Richard served over six years in Virginia, including three years as the shared-services forest fisheries biologist for both the George Washington and the Jefferson national forests Eventually, his position became full time on the George Washington.

Richard is an experienced biologist who has participated in forest and project level planning, implementation and monitoring, threatened and endangered species protection and management, wilderness management, and Wild and Scenic River studies

OTHER MAJOR CONTRIBUTORS

David T. Plunkett -- Forester

Dave has a bachelor's degree in forest science from Penn State University. His career with the U.S. Forest Service includes two years with the Northeastern Forest Experiment Station and eight years with the National Forest System.

Dave's experience in planning includes serving as an ID Team Leader with responsibilities for direction, assignments, coordination, schedules, writing, and process records.

Yvonne Campbell -- Clerk-Typist

Yvonne has a certificate in Information Word Processing/Legal Secretary from Dominion Business School (1989).

Yvonne has served as clerk/typist for the George Washington National Forest since January 1990

Kurt W. Gottschalk -- Research Forester

Kurt received his bachelor of science degree in forestry from Iowa State University in 1974, his master's and doctoral degrees in silviculture and forest ecology and in tree physiology from Michigan State University in 1976 and 1984. He joined the U S Forest Service's Northeastern Forest Experiment Station silviculture research unit at Warren, Pennsylvania, in 1979 where he studied problems of oak regeneration.

In 1983, Kurt transferred to the Forest Service's forest insect and disease research unit at Morgantown, West Virginia. He is a research forester on problems related to the use of silvicultural practices to minimize impacts of gypsy moth defoliation on forest stands.

Since May 1987, Kurt has been a Forest Service project leader. His unit is the Silvicultural Options for the Gypsy Moth unit in Morgantown. Kurt supervises scientists working on gypsy moth biological and economic impacts, hazard-rating and geographical information systems applications, the gypsy moth life systems model and development of expert systems for gypsy moth management.

CHAPTER 5

AGENCIES, ORGANIZATIONS, AND INDIVIDUALS ON THE REVISED PLAN AND EIS MAILING LIST

FEDERAL AGENCIES AND OFFICIALS

Office of Architectural and Environmental Preservation
Animal and Plant Health Inspection Service
Office of Equal Opportunity (OEO)
Rural Electrification Administration (REA)
Soil Conservation Service (SCS)
Deputy Assistant Secretary of Defense
Army Corps of Engineers (COE)
U.S. Navy (USN)
Resource Liaison Development Staff
Environmental Protection Agency
Federal Energy Regulatory Commission (FERC)
Office of Environmental Affairs
U.S. Department of Transportation
Federal Aviation Administration
Federal Highway Administration
U.S. Bureau of Mines
U. S. Coast Guard (Environmental Protection)
U.S. Department of Interior
U S. Fish and Wildlife Service

U.S. Senate - Virginia

John Warner
Charles Robb

U.S. Senate - West Virginia

Robert C. Byrd
John D. Rockefeller, IV

U.S. Representative - Virginia

Robert W. Goodlatte
Lewis F. Payne, Jr.
Frank R. Wolf
Frederick C. Boucher
Thomas J. Bliley, Jr.

U.S. Representative - West Virginia

Alan B. Mollohan
Bob Wise, Jr.
Nick J. Rahall, II

STATE AGENCIES AND OFFICIALS

L. Douglas Wilder, Governor of Virginia
Gaston Caperton, Governor of West Virginia

Virginia Agencies

Council on the Environment
Virginia Division of Forestry
Virginia Department of Game and Inland Fisheries
Virginia Department of Transportation
Fifth Planning District
Central Shenandoah Planning District
Lord Fairfax Planning District
Thomas Jefferson Planning District
Central Virginia Planning District
Rockingham County Planning District
Division of Mineral Resources
Virginia Department of Conservation and Recreation
Virginia Clearinghouse
Virginia Council on the Environment
State Historic Preservation Office
Natural Heritage Program

West Virginia Agencies

Division of Natural Resources
Division of Forestry
Division of Parks and Recreation
West Virginia Clearinghouse
State Historic Preservation Office
Natural Heritage Program

LOCAL OFFICIALS

Mayors

Harrisonburg	Clifton Forge	Woodstock
Staunton	Lynchburg	Lexington
Waynesboro	Edinburg	Covington
Buena Vista	Strasburg	

Board of Supervisors

Augusta	Alleghany	Bath
Botetourt	Frederick	Hardy
Hampshire	Highland	Monroe
Page	Pendleton	Rockbridge
Rockingham	Shenandoah	Warren

PUBLIC LIBRARIES AND UNIVERSITIES AND COLLEGES

Libraries	Rockingham County Public Library
	Jefferson-Madison Regional Library, Charlottesville
	Staunton Public Library
	Buena Vista Public Library
	Rockbridge Regional Library, Lexington
	Waynesboro Public Library
	Lynchburg Public Library
	Clifton Forge Public Library
	Bath County Public Library
	Handley Public Library, Winchester
	Pendleton County Library
Universities	University of Virginia
	James Madison University
	VPI and State University
Colleges	Dabney S. Lancaster Community College
	Lord Fairfax Community College
	Blue Ridge Community College
	Bridgewater College

ORGANIZATIONS

Appalachian Forest Management Group
Appalachian Hardwood
Appalachian Trail Conference
Baltimore Four Wheelers
Boondock Blazers Four Wheel Drive Club
Canoe Cruisers Association
Central Virginia Hang Gliding Association
Citizens Task Force
Columbia Natural Resources
Conservation Council of Virginia
Cowpasture River Farm
Dixie Four Wheel Drive Club
Earth First
Environmental Technology, Inc.
Friends of the North Fork Shenandoah River
Highland Co. Citizens Concerned about Laurel Fork
Indiana Four Wheel Drive Association
Institute for Environmental Negotiation
Izaak Walton League
Lumber Manufacturing Association of VA
Mountain Water and Soil District
National Audubon Society
National Rifle Association
Natural Bridge AT Club
Northern Virginia Trail Riders
Potomac Appalachian Trail Club
Ruffed Grouse Society
Saint Mary's River Committee
Sierra Club
Spring Tree Agri-Forestry Program
The Nature Conservancy
The Wilderness Society
Tidewater Four Wheel Drive Association
Valley Conservation Council
Virginia Farm Bureau Federation
Virginia Fibre Corporation
Virginia Wildlife Federation
Virginians for Wilderness
WESTVACO
Wildlife Management Institute

INDIVIDUALS

Martin Albert, M.D.
Angel Annis
Tom Anthon
Ernest & Lillie Argenbright
Joan Ashley
Dennis Austin
John F. Backels
Prof. Chris Bailey
Bob Bardwell
Capt. Alexander J. Barton
Lois Bayless
Mary F. Beach
J. Derek & Juliana Beatty
Julian R. Beckwith
Steve Bennett
Louis Berstein
Heidi Bibber
Larry Blamer
Dorothy C. Bliss
George Blomstrom
Charles T. Boggs
Chris Bolgiano
Paul E. Bonivich
Al Bourgeois
Lee Bowen
Nancye L. Bowman
William P. Boyer, Jr.
B. E. Bradley
Watt Bradshaw
Ted Brenig
W. Randy Brooks
Richard Brooks
Martha A. Burton
Randy Bush
Malcolm & Lynn Cameron
Chris Camuto
Henry D. Carr
Debra Chandler
Arthur M. Cheek
Harry Cheek
Ed Clark
John Clark
J. N. Coalter, Jr.
Eric T. Coiner
Rich Collins
Milton Colvin
John P. Cone, Jr.
Brian Conto
Adena Cook
Richard Coon
Faye Cooper
Frank Cooper
Philip Coulling
W. C. Crawford
Robert Crockett
Andre Crummett
James Csarnogusky
Lonnie T. Cullers
Charles H. Cunningham
John Cunningham
Rupert Cutler
Gilbert Davidson
Arthur B. Davies, III
James P. Davis
John R. Davy, Jr.
Mike Dawson
Bob Dean
Daniel Deeds
Steve DeLapp
J. C. Demoss
Dan Dessecker
Ernie Dickerman
Arline K. Diehl
A. Bruce Dotson
Daniel M. Downey
Robert G. Dreher
Dennis A. Dutterer
Alton J. Dutterer
Kurt Eckerstrom
Joe Epperson
Joe T. Evans
F. Wade Evans
Jonathan Evans
Linzy O. Evans
David D. Farmer
Jay Farrell
Sarah Faulconer
Bill Fawcett
Harvey Ferris

Mike Fies
Reed Franklin
Dan E. French
Bonnie Gallahan
Vernon Garber
James W. Garner, Jr.
Mark Gatewood
Kenneth Gersten
Robert H. Giles, Jr.
Brian Gingerich
Allan C. Glasscock
Ellis Godard
Karen Goode
Franklin W. Y. Green
Stanley B. Griffin
Richard Grist
David Gussman
Charles W. Hamric
Charles Lee Hanna
William Hardbarger
Richard Hardt
Eric Hauge
Paul M. Hendricks, M. D.
Fred R. Hepner, Jr.
Sam Hepner
W. P. Higgins, Jr.
William L. Hildebrandt
Gregg Hillmar
Richard T. Hodge
L. Ryan Hodges, III
Mark Hollberg
David L. Hook
Jack Horan
Charles Horn
Charles Huffman
George W. Hulseman
John D. Hutchinson, V
Dan Ingalls
Tommy Jamerson
William E. Jeavons
A. W. Jeffreys, Jr.
Larry J. John
Jeff Johnson
John Johnson
Steve Johnson
M. A. Jones
Mark Jones
John Kauffman
Larry A. Kemper
James Earl Kennamer
James Kinder
Tom King
Dave Kiser
Walter S. Kordek
Charles Kostelni
Hugo Kostelni
Dr. David Kovacic
Steven Krichbaum
Richard M. Kurshan
Alan Lane
W. W. Leaman
Bruce L. Legge
W. B. Leichter
Walt Lesser
Gerald E. Lewis
Nelson Prescott Lewis
Jim Loesel
Homer Long
Sandra Long
Steve Carter-Lovejoy
Reese F. Lukei, Jr.
Eric Lundquist
Kirk Lunsford, jr.
W. A Marcontell
Gary & Robin Marr
Lee Martin
G. Wayne Martin
John R. Martin
Michael Martin
H. E. Matics
Doris H. Matthews
John K. Maxwell
E. W. Mays, Jr.
Dana McCarron
William L. McDonnell
Susan McDowell
Dean McDowell
Bonnie McKeown
Daniel S. McGown
Harry McIlvaine
Mark C. McKissick
Norman Meadow
David Michel
Jason Leon Miller

John V. Miller
Leon S. Minckler
Larry Mohn
Greg Morrison
Dick Mortimer
Robert F. Mueller
Robert S. Munson
Gregg Murphy
David Nees
W. E. Neudorfer
Heather Newmarker
Eileen Niemi
George C. Norris
James Olin
Dave Nuss
Dawn Oshman
Frank Overbey
John F. Pagels
Steve Parks
Ralph W. Passarelli
Charlie Payne
Carl Peckinpaugh
Charles D. Pierce
L. M. Pleasants
Walter Pomeroy
Douglas T. Potter
Richard Prior
Douglas Quinn
Bill Ragette
Paula Rakes
Wayne Ramsey
Robert E. Raper
Charlie Ray
Ernest Reed
Owen Reed
William A. Regan
Jeff Rettig
Cliff Rexrode
Matthew Sampson
John Sandberg
Conrad Sansoucie
Jennifer Schroeder
E. A. Seaman
Roger Sherman
Paul Shrauder
Robert S. Shuttleworth
Juliana Simpson
Mark D. Sims
Boyd E. Skelton
Jackie L. Smith
Larry W. Snead
Stephen Snook
Lee Sonne
Dr. Rollin D. Sparrowe
William F. Staff
Donald H. Stark
Daivd N. Startzell
John Staton
Lawrence B. Steele, III
Preston Stevens
Wayne G. Strickland
Bill Sullender
Bruce Sundquist
Ronald D. Sutton
Mr. & Mrs Ralph Swecker
Charles A. Tanner, Jr.
Dr. Jesse C. Thompson, Jr.
Roger L. Thompson
Marvin Tinsley
Chris Topik
Paul F. Torrence
Terry & Dave Trageser
Ben Turley
Jim Underwood
Warren Upton
W. R. Vaiden
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Appendix A - Environmental Impact Statement
ISSUES AND OPPORTUNITIES

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INTRODUCTION

This appendix is included for two purposes:
1 To describe how the public is involved in the revision process.
2 To describe opportunities to resolve issues.

Included in a September 6, 1989, letter that directed the revision of the 1986 Forest Plan, the Chief of the Forest Service said.

> "Greater care must be given by the GWNF to assess public opinion in identifying issues We believe the Forest has done an appropriate job in compiling numerical data, however, we are not confident in the discussion of these data both for issues identification as well as for support of the final product."

PUBLIC INVOLVEMENT IN THE REVISION

In an effort to increase public involvement in all phases of the revision process, Forest staff initiated frequent contacts.
—Open meetings where the public learned about the planning process and also presented meaningful information. Table A-1 displays the list of public meetings and open houses held throughout the revision process

—In addition to media invitations to the general public and individual invitations to interested and affected parties, Forest managers answered a legal obligation to let peers and neighbors know what is happening on the GW Contacts were made with adjoining forests, other federal agencies, state, county and city governments, Indian Nations, universities District rangers contacted the owners of land that is intermingled with Forest Service land, neighbors who depend on the Forest for access to their land, members of local clubs and organizations A list of the parties consulted during the revision is located at the end of this appendix.

—Groups, individuals and agencies participated in the data collection and evaluation that are part of any planning effort For instance, members of the natural heritage programs for Virginia/West Virginia inventoried important biological areas on the Forest. Representatives of local universities helped locate stands with old growth characteristics, others assisted in the evaluation of roadless areas

Throughout the revision process the public participated in:
—the identification of issues,
—the formulation of management areas and management area prescriptions,
—the formulation of alternatives

Table A-1.
List of Public Meetings and Open Houses

	Public Meetings
January 20, 1990	Blue Ridge Community College
February 15, 1990	Sheraton Inn in Staunton
March 13, 1990	Holiday Inn in Staunton
April 17, 1990	Edinburg Fire Hall in Edinburg
May 15, 1990	Holiday Inn in Staunton
July 17, 1990	Edinburg Fire Hall in Edinburg
September 18, 1990	Sheraton Inn in Staunton
November 13, 1990	Howard Johnsons in Lexington
February 26, 1991	Howard Johnsons in Lexington
June 27, 1991	Edinburg Fire Hall in Edinburg
November 7, 1991	Ingleside Red Carpet Inn
February 13, 1992	Sheraton Inn in Staunton
July 14, 1992	Holiday Inn in Staunton
	Open Houses
March 5, 1992	Pedlar RD Office in Buena Vista
March 7, 1992	Deerfield RD Office in Staunton
March 12, 1992	James River RD Office in Covington
March 14, 1992	Lee RD Office in Edinburg
March 17, 1992	Dry River RD Office in Bridgewater
March 13, 1992	Bath County Courthouse in Warm Springs
March 24, 1992	East Hardy High School in Baker, W V
March 26, 1992	Brandywine Elementary School in Brandywine, WV

IDENTIFICATION OF ISSUES

The revision of the Forest Plan is complicated by a history of planning efforts that did not meet with public approval. To ensure that comments raised in these previous planning efforts were considered in the revision, the ID Team evaluated substantive comments from six sources. The comments became the issues that are addressed in the revision of the Forest Plan. The six sources of substantive comments are.

1. letters of comment received from the public during this revision;

2 management concerns received from employees of the Forest and the Regional Office during this revision (primarily in response to reviews of process records);

3 letters of comment received from the public during a supplemental analysis to significantly amend the 1986 Plan;

4. issues raised in 18 administrative appeals of the 1986 Plan;

5 pertinent issues raised in administrative appeals of projects implementing the 1986 Plan,

6 unresolved issues raised in comment to the DEIS for the 1986 Plan

The ID Team developed a six-step process for identifying substantive comments and then organizing them into issues.

Step 1.
Identify Comments

Members of the ID Team completed a content analysis on the 138 letters originally received in response to the Notice of Intent (NOI) that appeared in the *Federal Register* on November 6, 1989 This step continued as new letters of comment were received and incorporated throughout the revision process (CEQ regulations require that public involvement continue throughout the analysis)

The ID Team Leader reviewed comments to the draft environmental impact statement for the 1986 Plan, appeals to the 1986 Plan, selected project-level appeals, and letters in response to the NOI for supplemental analysis to identify substantive comments applicable to the revision effort.

Step 2.
Screen Comments

The ID Team identified three "screens" for substantive comments The purpose of screens is to eliminate comments that cannot be resolved in the revision or that are not pertinent to land and resource management planning Comments that are included in the revision met the following screens·

1. The George Washington National Forest has the capability and authority to resolve or participate in resolution of the issue.

2 Resolution of the issue will affect management activities on the George Washington National Forest

3 Resolution of the issue is possible in the context of the revision of the Forest Plan.

The results of the screening of substantive comments identified throughout the revision process is detailed in the process paper *Issue Identification—Revision of the Land and Resource Management Plan for the George Washington National Forest* that is filed with the planning records for the Revised Plan.

Step 3.
Formulate Issues

Those substantive comments that passed the screening criteria were grouped into topics based on the substance of the underlying issue (clearcutting, below-cost sales, etc) This grouping led to the more effective consolidation of substantive comments into potential public issues.

The ID Team reviewed the issue topics (and substantive comments) and identified 12 issues and numerous sub-issues A breakdown of the substantive comments by issue and sub-issue is contained in the process paper *Issues to be Addressed in the Revision of the Land and Resource Management Plan for the George Washington National Forest* on file in the Planning Records

The ID Team prepared draft copies of *Issues to be Addressed in the Revision of the Land and Resource Management Plan for the George Washington National Forest* for review by the Management Team, the Regional Office ID Team and the public. An interim paper entitled -*Issues of Concern to the Public*- was also provided for this review This interim paper provided an idea of how the issues would be analyzed and incorporated into the Forest Plan and EIS.

Step 4.
Identify Concerns

Correspondence received throughout the revision process from the Management Team and other Forest Service employees was analyzed to identify substantive comments These substantive comments were also screened according to the criteria used in Step 3 of this process. Those comments relevant to the revision of the Forest Plan have been incorporated into the appropriate issues and sub-issues

Step 5.
Public Notice

During the week of May 7th, 1990, the Forest mailed copies of a 12-page brochure entitled *ISSUES* to 200 interested individuals and organizations This brochure described the 12 issues in the form of articles on each issue A 50-page paper *Synopsis of Issues and Concerns* was provided to members of the public upon request

The ID Team Leader prepared a 5-page handout entitled *Issues and Concerns to be Addressed in the Revision of the George Washington Forest Plan* that contained a listing of the issues and sub-issues. This document was provided to attendees at the July 17, 1990, public meeting held at Edinburg, Virginia. Attendees were also provide with a checklist of documents available for review The latest version of *Synopsis of Issues and Concerns* was included on this checklist and was provided upon request

A revised Notice of Intent (NOI) was published in the *Federal Register* on October 23, 1990 The NOI contained the following information

"Twelve significant issues (including sixty-nine sub-issues) have been identified during the scoping process Interested individuals can receive a 64-page "Summary of Issues" that lists the issues, sub-issues and synopses of substantive comments being addressed in the revision of the *Land and Resource Management Plan for the George Washington National Forest* by contacting the Interdisciplinary Team Leader "

The process paper *Summary of Issues* replaced the process paper *Synopsis of Issues and Concerns*

Step 6.
Revision of Issues

Since the public retains the right to comment on the revision of the Forest Plan throughout the planning process, all letters received were analyzed for substantive comments and screened against the three criteria until the formulation of alternatives began. At that point, it was deemed impractical to continue scoping All substantive comments are recorded in the process paper *Issue Identification—Revision of the Land and Resource Management Plan for the George Washington National Forest*. The process paper *Issues to be Addressed in the Revision of the Land and Resource Management Plan for the George Washington National Forest* was periodically updated to reflect the new substantive comments.

Issues and sub-issues were periodically revised based on comments received from interested individuals, agencies and organizations. The following major changes were made·

1. Based upon comments received from the public, the ninth issue "Minerals" was expanded to "Resource Sustainability" with comments and two sub-issues from other issues incorporated under this issue.

2. Based on comments from 4-Wheel Drive representatives, the fourth issue was changed from "Off-Road Vehicle (ORV) Use" to "All-Terrain Vehicle (ATV) Use" and the concerns over four-wheel drive use on the Forest were added to the third issue, "Forest Access "

3 Based upon a request from the Bureau of Land Management, the sub-issue "Minerals" was expanded to an issue This action increased the number of issues to thirteen

OPPORTUNITIES TO RESOLVE ISSUES

The process paper *Issues to be Addressed in the Revision of the Land and Resource Management Plan for the George Washington National Forest* (hereinafter referred to as *ISSUES*) contains a listing of the substantive comments and a synopsis of substantive comments for the thirteen issues (including sixty-five sub-issues) being addressed in the revision These issues differ appreciably from the issues addressed in the 1986 Plan In the 1986 Plan, issues were formulated as planning questions (i e. "How Much and What Emphasis Should the Forest Place on Wildlife and Fisheries Habitat?") that could be addressed through the amount of goods and services or the assignment of various portions of the Forest to specific management areas In particular, many of them could be directly addressed by economic analysis. Many of the issues being addressed in the revision are environmental, social, or legal in nature and do not lend themselves to resolution by economic analysis.

The process paper *Addressing Issues and Concerns in the Revision of the Land and Resource Management Plan for the George Washington National Forest*, hereinafter referred to as *ADDRESSING ISSUES*) contains detailed information on how the individual sub-issues were addressed throughout the revision process When a sub-issue involved a NFMA requirement, it was usually documented and discussed in other process papers also References to the appropriate process papers are in *ADDRESSING ISSUES*

ISSUE 1. BIODIVERSITY

Sub-Issue 1: Natural Values of the George Washington NF

This sub-issue contains substantive comments reflecting public and agency concerns over the nature of biodiversity. Pages 5 through 7 of *ISSUES* contains a list of the substantive comments and a synopsis of comments.

Appendix J of the FEIS contains a detailed discussion of the legal requirements that the Forest must meet in terms of diversity Based on agency policy established in decisions on administrative appeals of land and resource management plans, the Forest must. (1) conserve threatened or endangered species, (2) maintain viable populations of native animal and plant species; (3) protect rare or unique biological communities; (4) provide habitat capability needed to support populations of species at selected levels for commercial, recreational, scientific, subsistence, or aesthetic values, (5) monitor trends in management indicator species relative to goals, objectives, and standards and guidelines established in the Forest Plan Management indicator species shall include threatened or endangered plant and animal species, sensitive species, special habitats and rare or unique biological communities; species, or groups of species being managed for commercial, recreation, scientific, subsistence or aesthetic values.

ISSUE 1. BIODIVERSITY (Cont)

Sub-Issue 2 Conversion

This sub-issue contains substantive comments reflecting public and agency concerns over the conversion of hardwood or hardwood-pine forest types to white pine and the replacing of Virginia or yellow pine forest types with white pine. Pages 8 and 9 of *ISSUES* contains a list of the substantive comments and a synopsis of comments

Appendix J of the FEIS contains a discussion of the legal requirements for *planned type conversion* incorporated into the NFMA Regulations

The present NFMA Regulations require that planned type conversion be *justified* by an analysis The only instance that the ID Team identified where such type conversion *might* be justified was when gypsy moth mortality had eliminated the potential for natural regeneration of desirable hardwoods In this instance, the NFMA Regulation concerning the regeneration of stands within 5 years after final harvest [36 CFR 219 27(c)(3)] would not be met This requirement relates to lands which are suitable for timber production. In essence, gypsy moth mortality could cause the paradox that some lands identified as suitable for timber production would either have to be artificially regenerated or designated as unsuitable for timber production

Given the economics of hardwood regeneration, most hardwood stands unable to be naturally regenerated would be artificially regenerated to pine-hardwood by planting white pine seedlings on a 15' x 15' spacing Such a practice would constitute type conversion

The ID Team determined that this requirement could not be analyzed at the programmatic level of the revision There is insufficient information to understand under what conditions and how often gypsy moth mortality would cause a failure of natural regeneration in hardwood stands This concern must be addressed and analyzed at the project-level during implementation Site-specific analysis must determine whether such conversion is justified

Sub-Issue 3 Old Growth

This sub-issue contains substantive comments reflecting public and agency concerns over old growth Pages 10 thru 13 of *ISSUES* contains a list of the substantive comments and a synopsis of comments

Within the context of the revision of the Forest Plan, there are serious questions over the definition of old growth for different ecotypes on the Forest, the areas of the Forest which qualify for old growth under any definition, and the methodology for creating future old growth

The opportunities for providing "old growth" on the Forest cannot be assessed until there is a definition of old growth for the different ecotypes on the Forest The Regional Timber Staff Unit is leading an effort to define old growth for the different ecotypes in the Southern Region Definitions are not due until after the Revised Plan is published In the meantime, the ID Team prepared "interim" definitions for the ten old growth forest types found on the Forest These interim definitions are displayed in Appendix H The ID Team also determined the number of acres in the CISC inventory that meet these interim definitions for the ten old growth forest types This information is also displayed in Appendix H

Due to the large amount of acreage in older age classes, and large acreages designated as unsuitable for timber management, the Forest should easily be able to provide ample old growth Through the location of management area prescriptions for each alternative and the location of the stands containing the ten old growth forest types, the ID Team determined the number of acres of each old growth forest type that was on lands suitable for timber production and lands unsuitable for timber production for each of the alternatives

There are stands (predominately hemlock) which have never been harvested that would qualify as "old growth" under any definition These stands are widely scattered throughout the Forest and are usually located in the upper reaches of mountain drainages, and typically contain a component of very large eastern hemlock Less than 1,000 acres are known to be in this condition These stands are either (1) in existing wilderness, (2) in the Little Laurel Research Natural Area, (3) in the "Special Biological Niches" recommended by the natural heritage programs for the Commonwealth of Virginia and State of West Virginia, or (4) roadless areas Those stands within the Little Laurel Research Natural Area and the existing wildernesses are protected in every alternative The probability is low that any of these stands would be harvested in any alternative since there is no appreciable market for large hemlocks.

ISSUE 1. BIODIVERSITY (Cont.)

Sub-Issue 4. Fragmentation

This sub-issue contains substantive comments reflecting public and agency concerns over fragmentation Pages 14 and 15 of *ISSUES* contains a list of the substantive comments and a synopsis of comments

ADDRESSING ISSUES discusses concerns about (1) fragmentation of habitat for proposed, endangered, threatened and sensitive species, (2) fragmentation of habitat for species that cannot easily migrate, (3) fragmentation of habitat for "area sensitive" species and (4) landscape ecology and the role of the Forest in the mid-Atlantic region

There is particular concern over those proposed, threatened, endangered and sensitive species on the Forest with very limited ranges (such as Cow Knob Salamander). The potential exists to fragment these habitats and further endanger these species or communities 42 "Special Biological Niches" (containing more than 88,000 acres) have been identified which contain proposed, threatened, endangered and sensitive species where fragmentation is a concern.

The habitat for species which are not mobile and therefore cannot easily migrate could be fragmented by the construction of system roads or other barriers to movement Biologists and ecologists have indicated that two systems of migration corridors are most effective to fully meet the needs of these species high elevation or "mountain-top" and riparian areas

The Forest is the largest block of federally-administered land in the mid-Atlantic region and serves an important role in providing an abundant reservoir of unfragmented habitat for area sensitive species Twenty-seven roadless areas have been identified on the Forest and range in size from almost 1,500 to more than 27,000 acres Their average size is approximately 10,000 acres Total area equals more than 260,000 acres or nearly 1/4 of the Forest Existing wildernesses contain 32,000 acres. In addition, tracts of "unsuitable" (for timber production) lands exist on the Forest Over half of the Forest is presently unsuitable, and provides blocks of unfragmented habitats and inter-linking corridors

The majority of the Forest is advancing in age, with approximately 25 percent being a century old or older Approximately 85,000 acres are 150 years old or older The combination of advanced age classes, large acreages of unsuitable lands and large acreages of roadless areas affords the Forest an opportunity to provide quantities of unfragmented habitat.

In terms of fragmentation from a landscape ecology perspective, some individuals and organizations believe that large areas of the Forest need to be incorporated into management areas that severely restrict or eliminate timber harvesting and road construction They contend that the fragmentation of the natural ecosystem by the development in the Shenandoah Valley and other private lands has created a situation that requires a strong remedy

Graph 2-23 and Table 3-44 display the number of acres by alternative that are "relatively unfragmented" or "relatively fragmented habitat" "Relatively unfragmented" habitat is defined by those management areas or portions of management areas that are unsuitable for timber production and have a management policy that precludes road construction or public vehicular access "Relatively fragmented" habitat is defined by those management areas or portions of management areas that are either suitable for timber production or include a desired future condition that encourages public vehicular access

Sub-Issue 5 Late Successional Species/Habitat

This sub-issue contains substantive comments reflecting public and agency concerns over late successional species and habitat Pages 16 and 17 of *ISSUES* contains a list of the substantive comments and a synopsis of comments

As discussed in *ADDRESSING ISSUES*, the Forest presently contains a large percentage of late successional habitat (over 50 percent is 70 years of age or older) This issue can be resolved by allowing the older vegetation on the Forest to continue to age.

ISSUE 1. BIODIVERSITY (Cont.)

Sub-Issue 6 Riparian Areas, Wetlands and Bogs

This sub-issue contains substantive comments reflecting public and agency concerns over the definition and management of riparian areas Pages 18 thru 24 of *ISSUES* contains a list of the substantive comments and a synopsis of comments

The process paper *Incorporation of the NFMA Requirements for Riparian Areas and Water Bodies into the Revision of the Land and Resource Management Plan for the George Washington National Forest* contains a discussion of the minimum legal requirement for complying with the NFMA Regulation dealing with riparian areas

ADDRESSING ISSUES also contains a discussion on the ability of the Forest to address these concerns. The Forest doesn't have an inventory with specific locations of riparian areas or intermittent streams and information on the dependent values associated with these riparian areas An inventory of riparian area location and dependent values has begun this year, but it is not due for completion until 1995 As such, the analysis of riparian areas must deal with riparian areas in general and not with the relative effects of different management emphases and intensities on the dependent values in specific riparian areas

Riparian areas are being addressed in terms of four different management "scenarios"·

1 Current Management. 100 foot no-cut zone on perennial streams; **OR** 200 foot no-cut zone on native trout streams, 100 foot no cut zone on other perennial streams

2 Mitigation Approach State Best Management Practices

3 Resource Approach. Management activities (including timber harvesting) only if it leads to the desired future condition

4. Natural Processes Approach Limited hands-on management

Intermittent streams are being addressed in terms of three management "scenarios"·

1 There is no restriction on management practices along intermittent streams

2. Timber harvesting within 30 feet of intermittent streams is limited to enhancing specific riparian-dependent resources but only after consultation and approval by both state and Forest biologists

3. No timber harvesting or road construction/reconstruction is permitted along intermittent streams

Wetlands, bogs and limestone sinks containing rare flora or fauna have been designated as "Special Biological Areas".

Sub-Issue 7 Management Indicator Species

This sub-issue contains substantive comments reflecting public and agency concerns over the selection and use of management indicator species within the Revised Plan Pages 25 thru 27 of *ISSUES* contains a list of the substantive comments and a synopsis of comments.

Appendix J "Legal Requirements for Diversity and Rationale for Selection of Management Indicator Species" contains a discussion of the management indicator species identified for the revision of the Forest Plan. Twenty-three management indicators have been identified These management indicators were chosen for three reasons

1 They are "demand" species for which the public has expressed concerns over population levels (white-tailed deer, black bear and wild turkey)

2 They are listed as threatened or endangered species (Indiana bat, northern flying squirrel, peregrine falcon, bald eagle, James spinymussel, shalebarren rockcress, swamp pink and northeastern bulrush)

ISSUE 1. BIODIVERSITY (Cont.)

Sub-Issue 7· Management Indicator Species (Cont)

3 They are ecological indicators. The Forest has selected nine management indicators which serve as ecological indicators
a Brown-headed cowbird is a parasitic species that inhabits open areas Selection of this species represents an attempt to quantify forest fragmentation in terms of intrusion of this species into forested areas
b Ovenbird and worm eating warbler are area-sensitive species which are vulnerable to forest fragmentation as they require relatively large undisturbed tracts for optimal habitat, and as ground nesters they are especially vulnerable to predation Openings, and the resultant edge, are attractive habitat for cowbirds, and mammalian and avian predators
c. Cow Knob salamander is an indicator of late successional habitat.
d. Tiger salamander is a species restricted to sink hole ponds on the forest
e. Pileated woodpecker is a species that prefers late successional habitat and is dependent on large snags for nesting
f. Common flicker is a species that prefers early-successional habitat
g Cave-dwelling bats on the Forest, which include big brown bat, Keen's myotis, eastern small-footed bat, little brown bat, and pipistrelle, are sensitive to disturbance to caves, and also are directly and indirectly sensitive to pesticides Gypsy moth defoliation, and/or spraying may lead to changes in available food source. Indiana bat is listed separately as it is a federally endangered species.
h. Brook trout is a native trout species which is most sensitive to changes in aquatic conditions in cold water streams.
i The sunfish family is a guild which can be used to determine any effects upon aquatic conditions in warmwater streams
j Yellow pine community represents 25% of forested lands and is dependent on fire for regeneration.
k Old growth forests represent forest conditions necessary for species requiring mature forests

Sub-Issue 8· Special Interest Areas (Research Natural Areas, Special Management Areas and Special Interest Areas)

This sub-issue contains substantive comments reflecting public and agency concerns over the identification and management of portions of the Forest which contain important biological, cultural or geological values Pages 27 thru 39 of *ISSUES* contains a list of the substantive comments and a synopsis of comments

ADDRESSING ISSUES contains a discussion of the the opportunities for identifying areas with forest types needed as research natural areas

Two Research Natural Areas (RNA) have been established on the Forest. They are maintained in a natural state for research and educational purposes Forest types represented are eastern white pine (SAF 21), eastern hemlock (SAF 23), bear oak (SAF 43), chestnut oak (SAF 44), pitch pine (SAF 45), and yellow poplar-white oak-northern red oak (SAF 59)

Little Laurel Run RNA, established in 1938, contains 2,000 acres on the Dry River Ranger District Ramseys Draft RNA, established in 1935, is now located inside Ramseys Draft Wilderness, and contains 1,700 acres on the Deerfield Ranger District.

Six areas are identified as candidates for consideration and possible designation as Research Natural Areas pending additional review and study. These areas are· Big Levels (12,000 acres), Laurel Run (3,400 acres), Maple Flats (1,400 acres), Shale Barren(s) (5,000 acres), Skidmore (2,300 acres), and Slabcamp/Bearwallow (2,800 acres)

ADDRESSING ISSUES contains a discussion of the special interest areas including biological sites, geological areas and historical and cultural sites.

The Virginia and West Virginia natural heritage programs and wildlife agencies, the USDI Fish and Wildlife Service, and the USDA Forest Service have identified additional "special biological areas" since the Forest Plan was completed. 42 areas totalling 68,000 acres have been identified which contain the best examples of karst sinkholes, mountain bogs, natural mountain ponds, caves, "island" mountain tops, shale barrens, and old growth These areas are home to most of the Forest's endangered, threatened and sensitive species. Table 3-44 in Chapter 3 lists the location, name and size of these areas

Besides recognizing and inventorying the special interest areas, the public has expressed concern over the management of these areas Since these areas contain unique biological, cultural or geological values, they could be designated as botanical, zoological, historical or geological areas as part of the decision within the Record of Decision for the Revised Plan.

ISSUE 2. BELOW-COST TIMBER SALES

Sub-Issue 1· The Forest's Below-Cost Timber Sale Situation

This sub-issue contains substantive comments reflecting public and agency concerns over the identification of the Forest as having a below-cost timber program The public has also expressed concern over the accounting principles used in the Timber Sale Program Information Reporting System (TPSIRS) Pages 40 thru 42 of *ISSUES* contains a list of the substantive comments and a synopsis of comments

Based on the Statement of Timber Sale Revenues and Expenses (Financial Account) in TSPIRS, the Forest has a below-cost timber sale program The annual net loss for 1988 thru 1990 is displayed in *ADDRESSING ISSUES*

The ID Team performed a "present net revenue" analysis for each alternative to determine the relative net annual revenue from the timber sale program in each alternative

Sub-Issue 2 Opposition to Below-Cost Timber Sales

This sub-issue contains substantive comments reflecting public and agency concerns over below-cost timber sales Pages 43 and 44 of *ISSUES* contains a list of the substantive comments and a synopsis of comments

The financial analysis required for Stage 2 Timber Resource Land Suitability indicated that the Forest can use low-intensity even-aged (clearcutting) timber management practices on some of the better sites on the Forest and have a profitable program in terms of timber revenues and direct timber costs Additional analysis revealed that the total costs (direct + fixed costs) of running the timber program would render any alternative involving a timber management program below-cost The opportunity to achieve an "above-cost" timber sale program seems to be implausible without substantially reducing or eliminating the fixed costs, substantially reducing or eliminating some of the direct timber costs, and/or substantially increasing timber receipts

Sub-Issue 3· Multiple Use Benefits from Timber Harvesting

This sub-issue contains substantive comments reflecting public and agency concerns over the multiple-use benefits which occur from the Forest timber program Pages 45 thru 53 of *ISSUES* contains a list of the substantive comments and a synopsis of comments

In the Draft Environmental Impact Statement, the ID Team explored the opportunities for assigning monetary values to wildlife benefits to analyze **some** of the benefits that could be attributed to a timber sale program This analysis was dropped in the FEIS because the ID Team believed that it presented an incomplete picture of the benefits that could be attributed to a timber sale program Many of the benefits do not possess a monetary value while others depend on site-specific situations

Sub-Issue 4 Compliance with USDA Policy on Below-Cost Timber Sale Programs

This sub-issue contains substantive comments concerning the Forest's compliance with a landmark appeal decision by the Department of Agriculture on the Forest Plans and EIS's for the San Juan National Forest and the Grand Mesa, Uncompahgre, and Gunnison National Forests Pertinent quotations from this decision are reproduced in *ADDRESSING ISSUES* Pages 54 thru 59 of the process paper *ISSUES* contains a list of the substantive comments and a synopsis of comments

The Department of Agriculture policy contained in this decision places specific analytic requirements on a National Forest with a below-cost timber sale program Compliance with these requirements is discussed in *ADDRESSING ISSUES* and is summarized in Appendix B of this EIS

Sub-Issue 5 Role of the Forest Timber Program in the Local Timber Market

This sub-issue contains substantive comments reflecting public and agency concerns over the relative impact of the Forest timber program on the local timber market and consequences upon other suppliers if Forest timber volume offered were reduced Pages 59 thru 62 of *ISSUES* contains a list of the substantive comments and a synopsis of comments

The process paper *Timber Supply and Demand Analysis for the George Washington National Forest* contains an assessment of the relative supply of timber products from the Forest in relation with the timber supply from other sources in a study area which included nineteen counties of Virginia and five counties of West Virginia Based on this analysis, the ID Team concluded that the prices charged for timber products within the market area of the Forest would not significantly change if the market share provided by the Forest is significantly altered

ISSUE 2. BELOW-COST TIMBER SALES (Cont.)

Sub-Issue 6 Effects of Timber Harvesting on Local Communities and Economies

This sub-issue contains substantive comments reflecting public and agency concerns over the negative impact on local communities and economies that would result from a reducing or elimination of the traditional amounts of timber volumes offered on the Forest. Pages 63 thru 66 of *ISSUES* contains a list of the substantive comments and a synopsis of comments

Chapter 3 of this EIS contains an explanation of the two forms of payments and a listing of the payments from 1979 thru 1990 to states and local governments. In the case of National Forest's where 25 percent Funds are less than $ 75 per acre, PILT is designed to supplement payments to a minimum of $ 75 per acre Total payments to counties containing portions of the Forest would not change until a county receives 25 percent Fund payments in excess of $ 75 per acre Based upon receipts from 1979 thru 1990, two-thirds to three-quarters of the total funds received by the counties containing portions of the Forest consist of PILT. Therefore, it is doubtful that any changes in the volume of products offered in any of the alternatives would substantially increase payments to counties

As discussed in *ADDRESSING ISSUES*, the ID Team used the economic effects model IMPLAN to determine the **relative** changes in employment and income which could be attributed to changes in the timber sale program in each of the alternatives.

The ID Team also assessed the likelihood that changes in timber volume off the Forest would affect local loggers, sawmills, furniture makers or pulpmills in the process paper *An Analysis of the Potential Geographic Impacts of Volume Changes in Timber Harvest on the George Washington National Forest Market Area*. Based on the analysis in this process paper, the ID Team reached the following conclusions.

1 The likelihood of logging firms and other businesses that traditionally purchase a moderate to large percentage of their volume from the Forest being able to move their operations to other commercial forest lands depends on the magnitude and location of any changes in timber offered on the Forest Logging firms within Alleghany County appear to have the lowest likelihood of substituting stumpage from the Forest with stumpage from other lands Logging firms in Amherst, Augusta, Bath, Highland, Pendleton and Rockbridge Counties have a somewhat higher likelihood of substitution Substitution is much more likely for logging firms in Bedford, Botetourt, Frederick, Grant, Hampshire, Hardy, Mineral, Page, Rockingham, Shenandoah and Warren Counties.

2 Generally, sawtimber off the Forest comprises less than 10 percent of the total sawtimber volume harvested off the Virginia counties in the Socio-Economic Impact Area It appears that the highest likelihood of a potential shortage of sawtimber volume would be from sawmills that are reliant on sawtimber volume from the Dry River or Warm Springs Ranger Districts The lowest likelihood would be for the Pedlar and Lee Ranger Districts Sawmills and furniture manufacturers located in Alleghany, Augusta, Bath, Highland and Rockingham Counties would be the most likely firms to be adversely affected by any reduction in the annual amount of sawtimber volume offered It is important to note that almost 60 percent of the sawtimber volume harvested in the Virginia counties in the Socio-Economic Impact Area comes from those counties that contain the Pedlar Ranger District The Pedlar Ranger District historically only offers 4 percent of that volume

3 Based on discussions with representatives of the timber industry and recent and historic price trends for forest products, there appears to be sufficient available supply of hardwood and pine pulpwood in the market area of the Forest to meet the needs of the four pulpmills These mills can draw from a variety of sources where they can obtain pulpwood and chips at different prices Raw material from the Forest does not appear to be a major factor (less than 5 percent) of the total raw material processed by these mills. The raw material from the Forest can be substituted by raw material from other sources, albeit at a higher marginal cost. Due to the large percentage of national forest lands in Alleghany, Augusta and Bath Counties, large reductions in raw material from these counties might require higher marginal costs to replace this material, particularly if reduction in material from the Forest were accompanied by similar reductions on the Jefferson and Monongahela National Forests.

ISSUE 2. BELOW-COST TIMBER SALES (Cont.)

Sub-Issue 7. Suitable Acres

This sub-issue contains substantive comments reflecting public and agency concerns over the number of acres which will be identified as suitable for timber production on the Forest Pages 67 thru 70 of *ISSUES* contains a list of the substantive comments and a synopsis of comments

The process paper *Incorporation of the NFMA Requirements for Timber Resource Land Suitability into the Revision of the Land and Resource Management Plan for the George Washington National Forest* contains an explanation of the three-step process for determining lands suitable for timber production [This information is summarized in Appendix B of this EIS and Appendix A of the Revised Plan.]

At the conclusion of Stage 1 (Physical) Suitability, 915,000 acres on the Forest were listed as "tentatively suitable" and could be suitable for timber production in any of the alternatives

The process paper *Incorporation of the NFMA Requirements for Timber Resource Land Suitability into the Revision of the Land and Resource Management Plan for the George Washington National Forest* also contains a discussion of the financial analysis performed for Stage 2 (economic) Timber Resource Land Suitability which examines timber revenues and direct timber management costs associated with different timber intensities on lands within similar economic characteristics Although this analysis does not lead directly to an identification of an above-cost program, the information is useful in determining which lands are most profitable in terms of timber management

Chapter 3 of this FEIS displays the allowable sale quantity associated with each of the alternatives The lands identified as suitable for timber production in each alternative are a result of Stage 3 Suitability Analysis described in *ADDRESSING ISSUES* and Appendix A of the Revised Plan

Sub-Issue 8 Timber Harvest Level (Allowable Sale Quantity)

This sub-issue contains substantive comments reflecting public and agency concerns over the allowable sale quantity or the maximum timber volume which could be offered on the Forest Pages 71 thru 73 of *ISSUES* contains a list of the substantive comments and a synopsis of comments

The maximum timber benchmark produced an allowable sale quantity of 1,860 million board feet. This decade production is far in excess of the ability of the local timber market to absorb such volumes being offered for sale As a rule of thumb, the Regional economists have maintained that, when the volume of timber products from a national forest forms a relatively small share of the total timber market, the market could accept a 50 percent increase in volume offered before an oversupply with resultant price decreases might occur. Since the Revised Plan should cover the years 1993 thru 2003, the Forest should be able to offer 680 million board feet during this time without depreciating timber prices Based on the above information, no alternative will be formulated with an allowable sale quantity in excess of 680 million board feet for the period of the Revised Plan.

The process paper *Timber Supply and Demand Analysis for the George Washington National Forest* contains the following projections of demand for timber volumes (converted from thousands of cubic feet to millions of board feet)

Table A-2
Estimated Annual Demand for Timber Products off the Forest

Year	Millions of Board Feet
Current (1989)	39
2000	45 5
2010	53
2020	57
2030	59
2040	60

ISSUE 3. FOREST ACCESS

Sub-Issue 1· The Importance of Motorized Access

This sub-issue contains substantive comments reflecting public concerns over the need for motorized access on the Forest. Pages 74 thru 77 of *ISSUES* contains a list of the substantive comments and a synopsis of comments.

Based on comments from individuals and organizations concerned with motorized access to the Forest, this sub-issue revolves around the management of existing roads on the Forest rather than the construction of roads to unroaded areas of the Forest

Sub-Issue 2 Road Management

This sub-issue contains substantive comments reflecting public concerns over the size of the Forest Transportation System, the standards of roads being constructed or reconstructed and the opening or closing of those roads Pages 78 thru 81 of *ISSUES* contains a list of the substantive comments and a synopsis of comments

ADDRESSING ISSUES contains details on the existing inventory of roads. The Transportation Inventory System (TIS) currently lists 1,710 miles of system roads. Of this amount, approximately 610 miles are open to the public year-round, an additional 440 miles are open seasonally, and 710 miles are closed year-round

Through agreements with Virginia and West Virginia, a group of state-owned roads that the Forest Service and cooperators use in managing the Forest are designated as Forest Highways As such, they may become eligible for additional federal funding. Forest Highways in Virginia total 695 miles, in West Virginia, 102 miles.

The Forest has varying degrees of access for use by the public Portions of the Forest are surrounded by private land, in some cases making public access very difficult or nearly impossible. Some areas lack the access needed to manage natural resources The remainder is readily accessible by open road or foot trail Many of these travelways are seasonally closed to protect resources such as soil, water, and wildlife.

Many of the roads now used were in place prior to establishment of the Forest Present transportation direction is to plan, develop, and operate a network of transportation facilities that provide for Forest user safety and convenience, as well as efficiency of operations to accomplish resource management and protection needs A major portion of the annual road program is directed at replacement access and reconstruction of Forest Development Roads to standards which meet today's environmental concerns and can be maintained for future use

The opportunity exists to keep the Transportation Information System mileage at or near the present total by making a commitment to closing unneeded roads, proper classification of facilities and proper temporary road location that allows effective physical closure when the facility is not needed

A concentrated effort has been made to reduce road construction costs Costs have been significantly reduced over the past few years by simplified survey and design and re-evaluation of minimum required road standards. Documented road management objectives are being utilized to identify future uses of the road and how the road is managed.

Sub-Issue 3. 4-Wheel Drive (4WD) Use

This sub-issue contains substantive comments reflecting public and agency concerns over providing opportunities for 4WD use and the management of 4WD use on the Forest. Pages 82 thru 88 of *ISSUES* contains a list of the substantive comments and a synopsis of comments

This sub-issue is closely related to concerns expressed in sub-issue 1. Although 4WDs can be used on any open forest development road on the Forest, only a portion of these roads satisfy the demand for 4WD recreation

There remains a concern over the nomenclature to be used for different types of off-highway vehicles (OHVs) The FEIS uses "licensed OHVs" to mean 4-wheel drive and other high clearance vehicles that are licensed by the Commonwealth of Virginia or the State of West Virginia

ISSUE 3. FOREST ACCESS (Cont.)

Sub-Issue 3. 4-Wheel Drive (4WD) Use (Cont.)

Within the Forest public road system, a number of roads provide a off-road experience for licensed OHVs These forest roads are typically steep, rocky, and/or infrequently maintained. The Forest has identified 160 6 miles of primitive system roads that offer a challenging experience to four-wheel drive and other licensed OHV users This list is reproduced in Chapter 3 of the Revised Plan under the description for Management Area 11

The Forest has also identified an additional 63 4 miles of primitive system roads that are seasonally opened to hunters Appendix J of the Revised Plan contains a listing of these roads

The transportation system includes 500 miles of system roads presently closed year-round with gates. The Forest has no inventory of how many of these roads would offer OHV opportunities For the purposes of analysis, the ID Team concluded that all of these gated roads would offer such opportunities Based on this, a maximum of approximately 725 miles of system roads could be managed to provide opportunities for licensed OHVs

Off-highway vehicle (OHV) use comprises an important part of the motorized recreation opportunities available on the Forest Based on comments to the draft environmental impact statement, the Forest evaluated the estimated demand for licensed OHV recreational use from the current Statewide Comprehensive Outdoor Recreation Plans (SCORP) for Virginia and West Virginia The details of this evaluation are discussed in Appendix B Table A-3 displays the estimated demand in miles for licensed OHVs for the Forest

Table A-3.
Estimated Demand for Licensed OHV Recreation Opportunities
(in Miles of Road)

1990	2000	2010
236	247	258

Sub-Issue 4 Access for Individuals with Disabilities

This sub-issue contains substantive comments reflecting public and agency concerns over providing opportunities for persons with disabilities to have motorized access to the Forest Page 89 of *ISSUES* contains a list of the substantive comments and a synopsis of comments

The Americans with Disabilities Act and other applicable legislation stresses the importance of providing access for disabled persons Under current management direction, approximately two miles of the Neal Run Trail on the Warm Springs Ranger District are open for motorized use by persons with disabilities during hunting season Most Ranger Districts have a program to provide hunting access to physically disabled hunters Hunters who possess a valid Virginia or West Virginia permit will qualify for this program Additional information is available from the Ranger District and state agencies

Sub-Issue 5 Hiking Trails

This sub-issue contains substantive comments reflecting public and agency concerns over the construction and management of hiking trails on the Forest Pages 90 and 91 of *ISSUES* contains a list of the substantive comments and a synopsis of comments

The Forest trail system includes approximately 914 miles of trails for various user types and with varying degrees of challenge to the users 842 miles of these trails have "general hiking" listed and 652 have "backpacking" listed as user opportunities

Appendix B of the Revised Plan contains a listing of the trails which could be constructed on the Forest to provide increased access The decision of where and when to construct or abandon any hiking trail, however, is a site-specific concern that must be address during project-level implementation of the Revised Plan and is highly dependent upon funding

ISSUE 4. ALL-TERRAIN VEHICLE (ATV) USE

Sub-Issue 1 Opposition to ATV Use

This sub-issue contains substantive comments reflecting public and agency concerns over severely limiting or even eliminating ATV use on the Forest Pages 92 thru 95 of *ISSUES* contains a list of the substantive comments and a synopsis of comments

In the Commonwealth of Virginia and the State of West Virginia, ATVs are not licensed and hence are not permitted on any open forest development roads Any management area that does not permit ATV trails would, in effect, bar ATVs from that portion of the Forest.

Opportunities for effectively eliminating or at least reducing illegal ATV use appear to rely on increased commitment and funding for law enforcement efforts

There remains a concern over the nomenclature to be used for different types of off-highway vehicles (OHVs). The FEIS uses "unlicensed OHVs" to mean motorcycles and other all-terrain vehicles that are not licensed by the Commonwealth of Virginia or the State of West Virginia

Sub-Issue 2 Advocacy of ATV Use

This sub-issue contains substantive comments reflecting public and agency concerns over the need to provide additional opportunities for ATV use on the Forest Pages 96 and 97 of *ISSUES* contains a list of the substantive comments and a synopsis of comments

Based on existing Forest Supervisor Orders, trails must be designated as available for ATV use to be operated legally on the Forest The Forest presently has constructed three all-terrain vehicle routes on the Forest.

1 The Taskers Gap/Peters Mill Run trails on the Lee Ranger District contain approximately 20 miles of trails Additional trails are planned within the Taskers Gap Complex

2 The Rocky Run complex on the Dry River Ranger District contains 15 miles of trails.

3 The South Pedlar complex on the Pedlar Ranger District contains approximately 25 miles of trails.

Proposals for additional ATV trails are assessed on a case-by-case basis using the criteria contained in Amendment #4 of the Forest Plan.

To determine possible suitable locations for ATV opportunities, individuals affiliated with ATV organizations presented the ID Team with a map showing the locations of areas on the Forest where an ATV network could be constructed These individuals located these areas on portions of the Forest where existing management direction would not conflict with the construction of such ATV networks Members of the ID Team worked with knowledgeable professionals on each of the Ranger Districts to assess the practicality and potential conflicts with these proposals They identified 19 areas (containing approximately 375 miles of trails) listed in *ADDRESSING ISSUES* Maps containing the locations of these areas are contained in the process records for the Revised Plan

Off-highway vehicle (OHV) use comprises an important part of the motorized recreation opportunities available on the Forest Based on comments to the draft environmental impact statement, the Forest evaluated the estimated demand for unlicensed OHV recreational use from the current Statewide Comprehensive Outdoor Recreation Plans (SCORP) for Virginia and West Virginia The details of this evaluation are discussed in Appendix B Table A-4 displays the estimated demand in miles for unlicensed OHV use for the Forest

Table A-4
Estimated Demand for Unlicensed OHV Recreation Opportunities
in Miles of Trail

1990	2000	2010
138	144	153

ISSUE 4. ALL-TERRAIN VEHICLE (ATV) USE (Cont.)

Sub-Issue 2 Advocacy of ATV Use (Cont)

The management direction included in Amendment #4 of the Forest Plan calls for a site-specific analysis to determine the need for any ATV route This practical advice appears to be the best method to determine a specific need for an ATV route on any location on the Forest

Sub-Issue 3 Management of ATV Use

This sub-issue contains substantive comments reflecting public and agency concerns over opportunities for managing ATV use on the Forest Pages 98 and 107 of *ISSUES* contains a list of the substantive comments and a synopsis of comments

Amendment #4 of the Forest Plan (dated February 1991) provided criteria for establishing ATV routes These criteria are reproduced in *ADDRESSING ISSUES*. These criteria have been revised and simplified in the Revised Plan (refer to the standards for Management Area 11 in Chapter 3 of the Revised Plan)

The opportunity to approve any particular motorized trail on the Forest requires site-specific analysis which would need to be completed during implementation of the Revised Plan Such trails would need to be limited to those management areas where ATV use is permissible

ISSUE 5. ROADLESS AREA MANAGEMENT

Sub-Issue 1. Unique Values Not Found on Private Lands

This sub-issue contains substantive comments reflecting public and agency concerns over unique values which are not found on surrounding private lands remote habitat for wildlife, primitive and semi-primitive recreation and natural beauty. Pages 108 and 110 of *ISSUES* contains a list of the substantive comments and a synopsis of comments

There are a number of ways to define those portions of the Forest that might provide "unique values not found on private lands".

1 Interested citizens have provided a map and description of a wilderness/corridor complex that could be applied to the Forest Such management, in addition to providing the most unfragmented habitat in terms of landscape diversity, would also provide the most unroaded areas by closing all of the Forest Service system roads within the jurisdiction of the Forest Supervisor The associated increase in semi-primitive non-motorized recreation opportunity spectrum acreage created by such a wilderness/corridor complex has not yet been calculated.

2. Chapter 7 of the *Land and Resource Management Planning Handbook* provides criteria for conducting a roadless area inventory in the eastern United States. As described in *ADDRESSING ISSUES*, 260,412 acres, or 25 percent of the Forest, could be managed as unroaded and/or recommended for wilderness study

3 Those portions of the Forest qualifying as SPNM ROS are presently "unroaded" and consist of a "core area" where the greatest opportunities for such unique values can now be found.

Sub-Issue 2 Wilderness Area Designation

This sub-issue contains substantive comments reflecting public and agency concerns over roadless areas which qualify for recommendation as wilderness study areas Pages 111 thru 127 of *ISSUES* contains a list of the substantive comments and a synopsis of comments

The process paper *Incorporation of the NFMA Requirements for Roadless Area Evaluation and Wilderness Management into the Revision of the Land and Resource Management Plan for the George Washington National Forest* contains a discussion of the requirement for evaluating "roadless areas" and recommending them as potential wilderness study areas

27 roadless areas have been identified on the Forest, containing approximately 260,412 acres (25 percent of the Forest) which could be recommended for wilderness study *ADDRESSING ISSUES* contains a listing of these roadless areas (with their individual acreages) Appendix C of this EIS contains a **Roadless Area Review and Evaluation Report** for each of the 27 areas

ISSUE 5. ROADLESS AREA MANAGEMENT (Cont.)

Sub-Issue 2: Wilderness Area Designation (Cont.)

A wilderness/corridor complex has been suggested which involves enlarging these areas and adding additional areas by closing and eliminating forest development roads The ID Team evaluated this proposal and found that most of the roads recommended for elimination were under Forest Service jurisdiction and could be legally closed

The estimated demand for recreation opportunities in a wilderness setting is contained in the process paper *Determining Wilderness Demand on the George Washington National Forest* Table A-5 displays the anticipated demand for the five decades of the RPA planning horizon

Table A-5
Estimated Annual Demand for Wilderness Recreation

Year	Thousands of RVDs
2000	13 0
2010	14.5
2020	16.1
2030	17 7
2040	18 9

Sub-Issue 3· Protection of Roadless Areas as Special Management Areas

This sub-issue contains substantive comments reflecting public and agency concerns over opportunities to manage roadless areas under other designations than wilderness or wilderness study. Pages 128 thru 132 of *ISSUES* contains a list of the substantive comments and a synopsis of comments

Roadless areas can be afforded a degree of protection similar to wilderness designation without formal designation as wilderness. Three reasons have been expressed by the public on why such designation might be advantageous.

1 A number of the Virginia and West Virginia Natural Heritage Program areas discussed in this process record will require some vegetation manipulation (primarily prescribed burning) to retain the unique communities found in these areas Designation of such portions of roadless areas as Botanical or Zoological Areas might better achieve these objectives with little loss of wilderness characteristics.

2 The Appalachian Trail Conference has expressed concern that maintenance of the AT could become prohibitively expensive if too many sections were included in wilderness The present management of the AT corridor retains wilderness characteristics.

3. If an area is not recommended for wilderness study, there are several other management options, or management areas where they can be protected or lightly managed so that their wilderness characteristics are preserved.

The ID Team determined the allocation of each of the roadless areas by using the Geographic Information System to map out the acreage of each roadless area allocated to different management areas in different alternatives There is a process paper entitled *Roadless Area Allocation by Management Area* that details the allocation for each of the fourteen alternatives considered in detail in the FEIS Table 3-17 displays the percentage of each roadless area allocated to management areas that either (1) recommend the roadless area for wilderness study, (2) do not permit road construction or other substantial development of the roadless area that would render it ineligible for future consideration as a roadless area, or (3) permit road construction and other development that might render the area ineligible for future consideration as a roadless area

ISSUE 5. ROADLESS AREA MANAGEMENT (Cont.)

Sub-Issue 4 Remote Recreation Experience (Semi-Primitive Non-Motorized Recreation Opportunity Spectrum)

This sub-issue contains substantive comments reflecting public and agency concerns over the inventory and management of areas identified as SPNM ROS Pages 133 thru 137 of *ISSUES* contains a list of the substantive comments and a synopsis of comments

Page II-37 of the Forest Plan EIS listed 33,022 acres of "primitive" and 250,978 acres of "semi-primitive non-motorized" ROS setting on the Forest. There is no information in the process records for the Forest Plan that indicate how this acreage was calculated or its location. The Forest Plan itself acknowledges no acreages by ROS setting Instead, all discussions center around the recreation opportunities in thousands of recreation-visitor days provided by the different ROS settings The ID Team has been unable to reconstruct the analysis that led to these acreage figures The existing inventory lists 167,000 acres of the Forest as SPNM ROS and no acreage qualifying for Primitive ROS As explained in *ADDRESSING ISSUES*, there are no areas on the Forest which could qualify for the "primitive" ROS setting, even if all roads within Forest Service jurisdiction could be closed

Throughout the development of the Revised Forest Plan and the supplemental analysis, the amount of acreage on the Forest qualifying for SPNM designation and the management practices allowed within such a setting has been a controversial subject This concern was intensified by the absence of any acreage on the Forest which meets the criteria for classification as primitive ROS land. On the George Washington, the SPNM ROS classification serves as a "proxy" for primitive. Thus, management practices permitted within SPNM lands are limited to those practices normally found in a primitive ROS setting In particular, no timber harvesting or road construction/reconstruction are permitted

Concerns over the SPNM ROS setting were further complicated by the existing definition of semi-primitive motorized (SPM) ROS setting, a definition that does not accurately portray the light-on-the-land management applied to many of these lands managed for black bear and wild turkey.

Appendix G of this FEIS contains a description of some additional ROS sub-classes added to provide more flexibility of management Semi-primitive motorized (sub-class 1); semi-primitive motorized (sub-class 2) and roaded modified.

The revision process uses "adopted" ROS classes to match the management direction of each management area with the permissible practices for the ROS settings Appendix G contains a table showing the adopted ROS class for each management area prescription

Sub-Issue 5 Wildlife Species Requiring Remote Habitat (Free From Recurrent Human Disturbance)

This sub-issue contains substantive comments reflecting public and agency concerns over the need for remote habitat to meet the habitat requirements of certain wildlife species. Pages 138 and 139 of *ISSUES* contains a list of the substantive comments and a synopsis of comments

A serious question has arisen over the use of black bear or wild turkey as indicators of remote habitat, particularly from a landscape ecology perspective. Pages A-10 and A-11 contain a discussion of the opportunities of providing undisturbed forest habitat for neo-tropical migrant bird species Two of the management indicators identified in Appendix J (ovenbird and worm eating warbler) are area-sensitive species Ovenbird, worm eating warbler and cowbird are deemed to be better indicators of the effects of management practices on species requiring remote habitat.

ISSUE 6 SPECIAL MANAGEMENT AREAS

Sub-Issue 1: Wilderness Management

This sub-issue contains substantive comments reflecting public and agency concerns over the need for detailed management plans for the existing wildernesses Pages 140 and 141 of *ISSUES* contains a list of the substantive comments and a synopsis of comments

There are four wildernesses on the Forest containing 32,269 acres There are small sections of Barbours Creek Wilderness (20 acres) and Shawvers Run Wilderness (95 acres) on the Forest These areas are almost completely on the Jefferson National Forest The boundaries of these two wildernesses cross the Forest boundaries in a few small places Both Barbours Creek and Shawvers Run are managed by the Jefferson NF

All four wilderness areas are managed according to specific guidelines contained in Wilderness Implementation Schedules that have been prepared for each area These Wilderness Implementation Schedules were prepared with heavy involvement of interested individuals and organizations

Sub-Issue 2· Wild and Scenic Rivers

This sub-issue contains substantive comments reflecting public and agency concerns over 14 rivers being evaluated for possible inclusion in the National Wild and Scenic Rivers System Pages 142 and 143 of *ISSUES* contains a list of the substantive comments and a synopsis of comments

Chapter 8 of the *Land and Resource Management Planning Handbook* discusses the process of wild and scenic river evaluation. Appendix D of this EIS contains an evaluation report for 14 rivers in or near the Forest which have been studied for eligibility and potential classification Of the 342 55 miles of rivers found to be eligible 4 6 miles qualify as wild, 147 68 miles qualify as scenic and 190 27 miles qualify as recreational.

These qualifying river segments will not be studied for a determination of suitability as part of the revision. Any such studies are to be conducted at a later date Until a final determination is made as to suitability or nonsuitability, the Forest Service is obligated to protect those qualities that made the rivers eligible

Sub-Issue 3· Scenic Byways

This sub-issue contains substantive comments reflecting public and agency concerns over the designation of additional scenic byways on the Forest Pages 144 and 145 of *ISSUES* contains a list of the substantive comments and a synopsis of comments.

There is one designated National Forest Scenic Byway on the Forest. The Highland Scenic Tour, located on the James River Ranger District, is a 19 6-mile loop following State Route 850, Forest Development Road 447 and State Route 770.

The Commonwealth of Virginia has designated nine Virginia Byways that lie within the National Forest boundary They are listed in *ADDRESSING ISSUES* *The State of West Virginia has no scenic routes designated within the National Forest boundary.*

The ID Team discovered that there are no official "criteria" which can be used to determine if a road is eligible as a "scenic byway" Apparently, any open road can be nominated by the agency for consideration as a scenic byway

Since scenic byways are a site-specific administrative decision, the ID Team did not pursue the nomination of other scenic byways *as part of the revision of the Forest Plan The Revised Plan could be amended to add other scenic byways in the future*

ISSUE 6. SPECIAL RECREATION MANAGEMENT AREAS (Cont.)

Sub-Issue 4· Areas of Important Scenic and Recreational Value

This sub-issue contains substantive comments reflecting public and agency concerns over the special designation and management of areas on the Forest of important scenic and recreational value Pages 146 thru 148 of *ISSUES* contains a list of the substantive comments and a synopsis of comments

The Forest Plan established 12 special management areas containing 66,244 acres These management areas consisted of portions of the Forest which had management direction different from the "General Forest Area" contained in Management Area 14 There is a brief description of the scenic or recreational values in each of these areas in Chapter IV of the Forest Plan.

Seven of these special management areas form all or part of seven of the roadless areas being evaluated on the Forest for possible recommendation as wilderness study. Skidmore, Dolly Ann Hollow, Southern Massanutten, Laurel Fork, Little River, Big Schloss and Mount Pleasant A **Roadless Area Evaluation Report** has been prepared for each of these areas that discusses their unique scenic or recreational values The Jackson River and North River are part of the river segments which qualify for wild and scenic river designation These river segments are discussed in detail in Appendix D of the FEIS

ADDRESSING ISSUES contains a description of the scenic and recreational values associated with four areas specifically mentioned in public comments. Hidden Valley, Mount Pleasant, Spy Rock and Three Ridges Concerns about the management of these areas could be resolved by placing these areas in management areas that do not permit road construction/reconstruction or timber harvesting

As described in *ADDRESSING ISSUES*, Management Area 21 has been formulated to be applied to four special management areas where the Revised Plan contains unique direction· Big Schloss, Laurel Fork, Little River and Mount Pleasant.

Sub-issue 5: Appalachian Trail

This sub-issue contains substantive comments reflecting public and agency concerns over the management of the portion of the Appalachian National Scenic Trail on the Pedlar Ranger District. Page 149 of *ISSUES* contains a list of the substantive comments and a synopsis of comments

Members of the ID Team met with representatives of the Appalachian Trail Conference considering any concerns that remain over the management of the Appalachian Trail and its corridor The Appalachian Trail Conference has a variety of concerns that they would like addressed in a revision of the Appalachian Trail Management Area standards and guidelines The Appalachian Trail Conference has also been in contact with members of the Regional Office Recreation Staff The Regional Office Recreation Staff is exploring the use of a "standard" management prescription that would be used in the Foreground Visual Zone of the Appalachian Trail Such a decision, however, will not be reached until after the Revised Plan is published.

The ID Team formulated a new management area prescription with new standards that is included in the Revised Plan These new standards represent those where the Forest Service and the Appalachian Trail Conference appear to be in agreement.

Sub-Issue 6. Fisheries

This sub-issue contains substantive comments reflecting public and agency concerns over the management of the fisheries on the Forest. Pages 150 and 151 of *ISSUES* contains a list of the substantive comments and a synopsis of comments

The existing fisheries resource is discussed in Chapter 3 of this FEIS There are no opportunities to create additional streams The FEIS also does not discuss opportunities to create additional lakes or ponds

Fisheries biologists with the Virginia Department of Game and Inland Fisheries cooperate with the Forest Fisheries Biologist in improving the productivity of cold water streams through the use of liming This practice is necessary if many of the trout streams on the Forest are to remain fertile More detailed information on the productivity of streams is found in Appendix J

ISSUE 7. AESTHETICS

Sub-Issue 1· Updating the Visual Quality Objective Inventory

This sub-issue contains substantive comments reflecting public and agency concerns over the accuracy of the visual quality objective (VQO) inventory. Pages 152 thru 154 of *ISSUES* contains a list of the substantive comments and a synopsis of comments

There has been a continuing issue about the accuracy of the visual quality objective inventory (VQO) in the Forest Plan. The ID Team has worked with representatives on each of the Ranger Districts to update the visual quality objective inventory and to incorporate this information into the revision analysis. The ID Team has been working with concerned individuals to ensure that the information in the inventory is correct and has been properly translated into the Geographic Information System for analysis and display

The visual quality objective analysis requires professional judgement As such, there is some degree of subjectivity in the identification *of sensitivity levels and variety classes (two of the components of the Forest Service Visual Management System). For this reason,* some of the inventory remains controversial

The ID Team has worked with interested publics to identify those portions of the Forest where there continues to be disagreement over the classification based on the existing inventory Although these disagreements have not been completely resolved, most areas of disagreement have been eliminated.

ADDRESSING ISSUES contains a table listing the existing VQO inventory and another table displaying the acreages where the ROS and VQO inventories are inconsistent

Sub-Issue 2 Effects of Timber Harvesting and Road Construction on Aesthetics

This sub-issue contains substantive comments reflecting public and agency concerns over a lack of management direction in the Forest Plan related to the visual quality objective inventory Pages 155 thru 157 of *ISSUES* contains a list of the substantive comments and a synopsis of comments

During the implementation of the Forest Plan, there has been continuing controversy over the apparent lack of visual standards to guide timber harvesting and road construction under various visual quality objectives. This question is addressed in two manners within the alternatives

1 Some alternatives retain the interim management standards contained in Amendment #4 to the Forest Plan

2. *Some alternatives contain a new set of standards entitled "Vegetation Management Contrast Reducing Techniques"*

3 Some alternatives contain no standards dealing with this question and leave any decisions on mitigation to project-level analysis during implementation

Sub-Issue 3: Opposition to the Maximum Modification VQO

This sub-issue contains substantive comments based on a Forest Plan appeal issue over the legality of the maximum modification visual quality objective Page 158 of *ISSUES* contains a list of the substantive comments and a synopsis of comments.

As displayed in a table in *ADDRESSING ISSUES*, the maximum modification VQO is inconsistent with the roaded natural or roaded *modified ROS classification and unacceptable with the semi-primitive motorized and semi-primitive motorized ROS classification* Therefore, any management area prescriptions applied to portions of the Forest presently inventoried as maximum modification will use adopted VQOs of modification, partial retention, retention or preservation to attain their goals and objectives, thereby eliminating the maximum modification VQO.

ISSUE 7. AESTHETICS (Cont.)

Sub-Issue 4 Visual Quality Objectives as a Management Goal

This sub-issue contains substantive comments reflecting public and agency concerns over the use of VQOs as management goals The Forest Plan only viewed the VQO inventory as an inventory, not as a management decision Pages 159 and 160 of *ISSUES* contains a list of the substantive comments and a synopsis of comments

The ID Team addressed the concerns over the use of visual quality objectives as management goals by assigning a visual quality objective to each management area prescription which in turn guides the management practices used to achieve the objectives of the management area prescription When these management area prescriptions are allocated to portions of the Forest, these visual quality objectives are retained or adopted *ADDRESSING ISSUES* contains a table displaying the visual quality objectives assigned to each management area prescription. Appendix G of this FEIS shows the adopted VQO for each management area prescription in the form of a footnote related to the adopted ROS class

ISSUE 8 VEGETATION MANIPULATION

Sub-Issue 1 NFMA Requirement For Optimality of Clearcutting

This sub-issue contains substantive comments based on a Forest Plan appeal issue over the question of meeting the NFMA requirement that clearcutting may only be used when it is the "optimum" method Pages 161 and 162 of *ISSUES* contains a list of the substantive comments and a synopsis of comments

The process paper *Incorporation of the NFMA Requirements for Even-Aged Management into the Revision of the Land and Resource Management Plan for the George Washington National Forest* contains an explanation of the rationale leading to the identification of standards requiring site-specific analysis and disclosure to determine when clearcutting is the optimum method and clearcutting is appropriate These standards, quoted in *ADDRESSING ISSUES*, are incorporated into the common standards for any alternative that permits even-aged management

Clearcutting can only be employed on the Forest when it is determined to be the optimum method to achieve the objectives and requirements of the Revised Plan based on site-specific analysis and disclosure Since such disclosure is not practical within the programmatic environmental document for the Revised Plan, any decision to employ clearcutting (or other even-aged timber harvest cuts) must be made in project-level decision documents

Sub-Issue 2 Clearcutting

This sub-issue contains substantive comments reflecting public and agency concerns over the use of clearcutting as a timber harvest cutting method Pages 163 thru 169 of *ISSUES* contains a list of the substantive comments and a synopsis of comments

The process paper *ADDRESSING ISSUES* contains a discussion of the restrictions on clearcutting contained in the agency ecosystem management policy

In recent years, the Forest has been moving away from the use of clearcutting into the use of alternative harvest cutting methods Based on acres offered for sale, clearcutting has declined from 78 percent in Fiscal Year 1988 to 58 percent in Fiscal Year 1990.

The alternatives contain a different mixture of clearcutting and uneven-aged management **Alternative 9** prohibits the use of even-aged management, hence clearcutting **Alternatives 11** and **13** allow the use of even-aged management practices but precludes clearcutting **Alternatives 8** and **8A** limit the use of clearcutting to circumstances where no other silvicultural method will achieve the desired results **Alternative 12** limits clearcutting to no more than 1,250 acres per year **Alternative 2** limits the use of clearcutting to no more than 2,500 acres per year **Alternatives 4, 5, 7, 10 and 14** leave the question of the amount of clearcutting to project-level analysis and decisionmaking

ISSUE 8. VEGETATION MANIPULATION (Cont.)

Sub-Issue 3. Alternative Timber Harvest Methods (Shelterwood, Group Selection & "Selective" Cutting)

This sub-issue contains substantive comments reflecting public concerns over the use of timber harvest cutting methods other than clearcutting. Pages 170 thru 176 of *ISSUES* contains a list of the substantive comments and a synopsis of comments.

To respond to this issue, alternatives contain management area prescriptions which limit the use of even-aged timber harvest methods. In particular, **Alternative 9** limits timber harvest cutting methods to group or individual tree selection. **Alternative 13** permits the use of two-staged shelterwood, group selection or individual tree selection

Sub-Issue 4 Featured Species

This sub-issue contains substantive comments reflecting public and agency concerns over featured species Pages 177 thru 184 of *ISSUES* contains a list of the substantive comments and a synopsis of comments.

Pages IV-18 thru IV-20 of the Forest Plan contain standards that are applicable to different portions of the Forest depending upon which wildlife species is featured The Forest Plan establishes such management direction for white-tailed deer, black bear, wild turkey, ruffed grouse and gray squirrel Although the Forest Plan didn't specify the location of the portions of the Forest where these species were featured, virtually the entire Forest had one of these species featured

The featured species concept implies an active management program designed to optimize habitat for the featured species. By assigning the entire Forest to one of the game species, the Forest Plan implied that wildlife management would be driven by the management of game species

To counter this concern, the ID Team devised management area prescriptions which emphasized different mixtures of multiple uses The process paper *Management Area Prescriptions* contains a description of management area prescriptions for 20 management areas. Four of these management areas emphasize management of traditional game species and those non-game species which also benefit from such practices. 14 [black bear, pileated woodpecker and (where applicable) Cow Knob Salamander], 15 (wild turkey and pileated woodpecker), 16 (white-tailed deer, common flicker and ruffed grouse); and 22 (small game and watchable wildlife). Many of the other management area prescriptions provide favorable habitat for different wildlife and plant species while emphasizing other natural resources. The ID Team decided that, in fact, many of these other management area prescriptions favor gray squirrel by allowing vegetation to age with minimal intervention

ISSUE 9. RESOURCE SUSTAINABILITY

Sub-Issue 1· Ecosystem Management

This sub-issue contains substantive comments reflecting public and agency concerns over a failure to practice ecosystem management on the Forest Pages 184 thru 195 of *ISSUES* contains a list of the substantive comments and a synopsis of comments

The process paper *ADDRESSING ISSUES* contains a discussion of the agency ecosystem management policy

The agency is actively managing areas to increase or maintain elements of biodiversity in the ecosystem These include managing for restoration and recovery of rare plants and animals, for example, through prescribed burning of critical habitat; establishing Research Natural Areas and Special Interest Areas to maintain representative ecosystems and to study their management, maintaining stewardship of wilderness areas for their natural values, non-native species control, integrating the protection of biodiversity as a goal in timber sales Active research includes determining and developing methods to measure and monitor diversity of plants and animals and conducting research on sensitive species The agency is also working in concert with conservation and other private organizations to conduct biological inventories, develop a regional classification of natural communities, and species and habitat management guides.

This public concern can be resolved by allocating much, if not all, of the Forest to management area prescriptions which do not allow the use of vegetation manipulation

ISSUE 9. RESOURCE SUSTAINABILITY (Cont.)

Sub-Issue 2· Extirpated Species

This sub-issue contains substantive comments reflecting public concerns over a failure to introduce extirpated species on the Forest. Pages 196 and 197 of *ISSUES* contains a list of the substantive comments and a synopsis of comments.

The NFMA Regulations contain a requirement that·

"Biologists from State fish and wildlife agencies and other Federal agencies shall be consulted in order to coordinate planning for fish and wildlife, including opportunities for the reintroduction of extirpated species."

The USDA Forest Service is not the lead agency in the introduction of extirpated species It cooperates with the appropriate state or federal agency in the introduction of such species

The Forest Wildlife Biologist has contacted the appropriate representatives of the Virginia Department of Game and Inland Fisheries, West Virginia Division of Natural Resources, Virginia Heritage Program and USDI Fish and Wildlife Service. The West Virginia Division of Natural Resources has reintroduced the fisher The Virginia Department of Game and Inland Fisheries has reintroduced the otter, plans to reintroduce the fisher, are transplanting snowshoe hares to bolster a disappearing population, and are working with the Forest to reintroduce the peregrine falcon The Virginia Natural Heritage Program is not, at this time, in favor of reintroducing bog rose (Arthusia bulbosa) No federal or state agency is currently considering reintroducing species such as the cougar, wolf, buffalo, and elk.

The ID Team has developed a management area prescription for the "core" of large wilderness areas where habitat could be provided for extirpated species such as the gray wolf and the cougar

Sub-Issue 3 Timber Management

This sub-issue contains substantive comments reflecting public concerns over the ecological effects of timber management on the Forest Pages 198 thru 203 of the process paper *ISSUES* contains a list of the substantive comments and a synopsis of comments

The process paper *Management Area Prescriptions* contains a description of management areas that permit or prohibit the harvesting of timber. There are seven management areas where lands are suitable for timber management For the remaining management areas, the lands would be unsuitable for timber management Such a classification, however, does not preclude salvaging as a result of natural catastrophic events or achieving other multiple use purposes through selective cutting Six management areas eliminate the possibility of any timber harvesting and road construction

Sub-Issue 4· Opposition to Herbicide Use

This sub-issue contains substantive comments reflecting public and agency concerns over the use of herbicides on the Forest Pages 204 and 205 of *ISSUES* contains a list of the substantive comments and a synopsis of comments

On July 27, 1989, the Regional Forester signed the *Record of Decision for the Final Environmental Impact Statement -- Vegetation Management in the Appalachian Mountains* His decision included Amendment #3 to the Forest Plan which added almost 100 standards providing specific mitigation measures for prescribed fire, mechanical methods, herbicide methods and manual methods of vegetation manipulation These standards are included in the process paper *Common Standards* and are included in the Common Standards in the Revised Plan

The revision of the Forest Plan deals with the question of herbicides in terms of whether their use is compatible with achieving the objectives of any management area prescription Herbicides cannot be used on the Forest without site-specific analysis and disclosure at the project-level As such, the management area prescriptions that include the use of herbicides among the management practices are permissive in that they retain the use of herbicides as an option

The process paper *Management Area Prescriptions* contains a description of eight management areas that do not include the use of herbicides among the management practices Aerial application of herbicides is only permitted in management area prescription 20B Any project level analysis would need to include a "no action" alternative and one or more alternatives that consider management practices other than aerial application of herbicides to achieve management objectives To address the concern over the use of herbicide applications to maintain utility transmissions lines, a standard in management area prescription 20E was formulated for use in **Alternative 3**

ISSUE 9. RESOURCE SUSTAINABILITY (Cont.)

Sub-Issue 5: Concern With Water Quality and Soil Productivity

This sub-issue contains substantive comments reflecting public and agency concerns over the management of critical watersheds, nutrient values and the recharge of groundwater. Pages 206 thru 209 of *ISSUES* contains a list of the substantive comments and a synopsis of comments.

The process paper *Incorporation of the NFMA Requirements for Conserving Soil and Water Resources and Not Allowing Significant or Permanent Impairment of the Productivity of the Land into the Revision of the Land and Resource Management Plan for the George Washington National Forest* contains an explanation of the rationale leading to the identification of standards to ensure that management area prescriptions do not cause significant or permanent impairment of the productivity of the land. The accompanying paper *Effects of Commercial Clearcutting on Nutrient Losses in Appalachian Forests* contains a summary of research on the effects of clearcutting on nutrient loss.

The opportunities to effect groundwater recharge are limited on the Forest Chapter 3 of this FEIS describes the situation in terms of groundwater recharge. Normal forest management activities are not considered to impact the groundwater resources

The 8,677-acre Little River Management Area described on pages IV-44 and IV-45 of the Forest Plan is the only area on the Forest that the ID Team recognized as a "critical watershed" that required special management direction to handle unusual watershed conditions.

Members of the public have also pointed out that the municipal watersheds on the Forest also deserve special protection. Fourteen municipal water supplies rely directly on the Forest for water. *ADDRESSING ISSUES* contains a description of these municipal watersheds The process paper *Management Area Prescriptions* contains a description of a management area prescription which is designed to manage any critical watersheds on the Forest This management area prescription can also be applied to municipal watersheds in those alternatives stressing special protection of those areas.

The ID Team decided not to perform a demand analysis for water use Analysis performed during the preparation of the Forest Plan demonstrated that the amount of water produced under natural conditions on the watersheds of the Forest met and would continue to meet any anticipated water needs for the communities within and adjoining the Forest, at least in the short-term. The following quotation is taken from page 71 of the *Analysis of the Management Situation*, dated February 1984

"The total current surface water use is estimated at 7,090 million gallons (21,756 acre-feet) per year Groundwater use (wells and springs) is estimated at 147 million gallons (451 acre-feet) per year This use is less than 2 percent of the surface water yield "

This decision is further discussed in the process paper *Water Supply Summary For Virginia* on file in the process records for the revision of the Forest Plan

The ID Team also determined that there was no apparent reason to analyze the economic advantages of increased water supplies from different mixtures of management practices This is documented in the process record *Placing a Value on Water Yields from the George Washington National Forest* also on file in the process records for the Revision of the Forest Plan.

Sub-Issue 6: Hazards of Wildfire

This sub-issue contains substantive comments reflecting public and agency concerns over the natural role of fire, the difficulties arising in wildfire control from gypsy moth mortality and urban-wildland interface Page 210 of *ISSUES* contains a list of the substantive comments and a synopsis of comments

The process paper *Incorporation of the NFMA Requirements for Minimizing Serious or Long-Lasting Hazards into the Revision of the Land and Resource Management Plan for the George Washington National Forest* contains a discussion on the legal requirements for minimizing serious or long-lasting hazards from wildfire incorporated into the NFMA Regulations

The process paper *Management Area Prescriptions* contains a description of one management area, applied to the "core" of large wilderness areas, which contains a standard that permits fire to play its natural role in the George Washington National Forest

The process record *Common Standards* contains a standard on urban/wildland interface that applies to all management areas

ISSUE 10. MINERALS

This issue contains substantive comments reflecting public and agency concerns over the management of minerals on the Forest Pages 211 thru 214 of *ISSUES* contains a list of the substantive comments and a synopsis of comments

ADDRESSING ISSUES contains a discussion on the relationship of the Forest Service and Bureau of Land Management (BLM) in the management of the mineral estate on the Forest BLM has been identified as a cooperating agency in this EIS.

Mineral management options on the George Washington NF include, making leasable and salable minerals available over the entire Forest (exceptions are wilderness and wilderness study areas), making leasable and salable minerals available but with certain special stipulations in specific areas, or making specific lands administratively unavailable for leaseable and salable minerals

In the case of leasable minerals other than oil and gas, proposals to "withdraw" minerals on blocks of land in excess of 5,000 acres, must follow the formal withdrawal process outlined in Section 204 of the Federal Land Policy and Management Act of 1976 This process requires the federal agency to prepare a detailed report citing the need and tradeoffs of the proposal The report is submitted before the U S Congress for a final ruling

Demand for mineral commodities on the Forest is generally low with a few exceptions in certain areas (refer to Chapter 3 of this EIS for a full discussion of these resources) Due to the large amount of private land in the proclamation boundary of the Forest, minerals are often produced on these private lands As these supplies are depleted and new sources sought, the Forest can expect to receive more requests for mineral development opportunities from the public New uses and technology for mineral products will also serve to increase the demand for minerals on the Forest.

Oil and gas leasing is one mineral resource that will require a detailed analysis to identify suitable areas on the Forest to make available for leasing and possible development Recent federal legislation and new Forest Service regulations require Forests to do "upfront" leasing analyses prior to leasing. This analysis will be based on a number of factors including mineral potential, environmental concerns, and the energy needs of the Nation This EIS will contain the documentation of this analysis and identify areas of the Forest available/unavailable for leasing and development Appendix E of this EIS contains more information on mineral leasing

ISSUE 11. GYPSY MOTH

Sub-Issue 1· Setting Policy on Gypsy Moth in the Revised Forest Plan

This sub-issue contains substantive comments reflecting public and agency concerns over the ability of the Revised Plan to establish management direction on gypsy moth Pages 214 and 215 of *ISSUES* contains a list of the substantive comments and a synopsis of comments

The process paper *Incorporation of the NFMA Requirements for Minimizing Serious or Long-Lasting Hazards into the Revision of the Land and Resource Management Plan for the George Washington National Forest* contains an explanation of the rationale leading to the identification of standards for the management of gypsy moth that are designed to meet NFMA Regulations on forest pest organisms

The current management direction for the suppression of gypsy moth is contained in the *Record of Decision—USDA Forest Service—Appalachian Integrated Pest Management (AIPM)—Gypsy Moth Demonstration Project* As explained on page 1 of this document "The AIPM project is designed to be a demonstration project anticipated to run approximately five years." Gypsy moth suppression policy is also based on the *Final Environmental Impact Statement as Supplemented* [in] *1985—USDA Gypsy Moth Suppression and Eradication Projects* "

All of these documents deal with intervention tactics designed to control gypsy moth populations They also deal with more than the George Washington National Forest The *Final Environmental Impact Statement as Supplemented* [in] *1985—USDA Gypsy Moth Suppression and Eradication Projects* deals with policy for suppression and eradication projects in cooperation with State and Federal agencies The *Final Environmental Impact Statement—Appalachian Integrated Pest Management (AIPM)—Gypsy Moth Demonstration Project* deals with private, municipal, county, State and Federal lands in 18 counties of Virginia and 20 counties of West Virginia

It is beyond the scope of the revision of the Forest Plan to deal with policies on which intervention techniques should be used under differing environmental situations and conditions Such decisions are more properly considered in environmental documents dealing with suppression and eradication projects It is, however, within the scope of the revision to consider the following

ISSUE 11. GYPSY MOTH (Cont.)

Sub-Issue 1· Setting Policy on Gypsy Moth in the Revised Forest Plan (Cont)

1. portions of the Forest where any suppression and eradication projects are inappropriate under specific management area prescriptions,

2 portions of the Forest where certain intervention techniques are inconsistent with specific management area prescriptions;

3 opportunities for long-term mitigation of gypsy moth effects through vegetation management practices.

Sub-Issue 2· Control of Gypsy Moth Populations

This sub-issue contains substantive comments reflecting public and agency concerns over the control of gypsy moth populations on the Forest Pages 216 thru 218 of *ISSUES* contains a list of the substantive comments and a synopsis of comments.

Page 9 of the *Record of Decision—USDA Forest Service—Appalachian Integrated Pest Management (AIPM)—Gypsy Moth Demonstration Project* contains management direction in regard to gypsy moth suppression projects within wilderness This management direction is expressed as standards in management area prescription 8A in *Management Area Prescriptions*

Gypsy moth suppression treatments within any wilderness will be controversial. In evaluating the four circumstances under which such treatment could occur, the ID Team reached the following conclusions·

1. The general rule for questions involving treatments in wilderness is to take no action

2. The probability that any of these circumstances will occur is relatively low, quite possibly rendering the question of gypsy moth suppression projects in wilderness moot

3. The circumstances permitting exceptions to the no treatment option are permissive in nature rather than mandating any action As such, any proposal for gypsy moth suppression treatment in wilderness would require site-specific analysis and disclosure that provided clear rationale for the need for such action in light of the four circumstances Also, alternatives for any such project would have to include a no action alternative.

4. The first exception deals with federally threatened and endangered species It is consistent with the management policy needed to comply with the Endangered Species Act

5 The *Record of Decision—USDA Forest Service—Appalachian Integrated Pest Management (AIPM)—Gypsy Moth Demonstration Project* sets a consistent policy for gypsy moth suppression projects within wildernesses for the George Washington, Jefferson and Monongahela National Forests

Considering that the Gypsy Moth Demonstration Project is of limited duration and the nature of the circumstances under which suppression projects could be permitted, the ID Team decided that additional management area prescriptions for wilderness containing alternative gypsy moth suppression policies would not be necessary

Sub-Issue 3 Silvicultural Practices

This sub-issue contains substantive comments reflecting public and agency concerns over the use of silvicultural practices in terms of gypsy moth Page 219 of *ISSUES* contains a list of the substantive comments and a synopsis of comments

There is a research work unit of the Northeastern Forest Experiment Station located at Morgantown, West Virginia that is exploring the question of "Silvicultural Options for Gypsy Moth" This unit is headed up by Dr Kurt Gottschalk (who serves as a member of the ID Team revising the Forest Plan)

Although research on gypsy moth is beginning to suggest some possible silvicultural options for managing National Forests in a manner that will reduce damage from gypsy moth infestations, this research has not reached a stage where there is clear and irrefutable evidence that certain silvicultural practices are beneficial in reducing damage or mortality to tree species

The process paper *Common Standards* contain standards which provide direction for silvicultural treatments in many management area prescriptions. These standards are reproduced in *ADDRESSING ISSUES*

ISSUE 12. ADEQUACY OF THE REVISION

Sub-Issue 1 Inadequacy of Environmental Disclosure

This sub-issue contains substantive comments reflecting public and agency concerns over the inadequacy of the environmental disclosure in the Forest Plan EIS. Pages 220 and 221 of *ISSUES* contain a list of the substantive comments and a synopsis of comments.

As described in *ADDRESSING ISSUES*, the Environmental Impact Statement for the Revised Plan contains a programmatic analysis concerning the estimated cumulative effects of the management practices (or lack of management practices) associated with any alternative The environmental disclosure does not deal with specific management practices or specific areas of the Forest except in a broad and general way This disclosure is sufficient for the types of decision that are to be made in the record of decision for this FEIS

The Advance Notice of Proposed Rulemaking published in the *Federal Register* on February 15, 1991 articulated the emerging policy on the types of decisions made in a Forest Plan and the type of environmental disclosure needed to support these decisions. Pertinent sections of this Advance Notice are quoted in *ADDRESSING ISSUES*

Sub-Issue 2. Inadequate Range of Alternatives

This sub-issue contains substantive comments reflecting public and agency concerns over the range of alternatives being considered in the revision Pages 222 thru 224 of *ISSUES* contains a list of the substantive comments and a synopsis of comments.

In his September 6, 1989 letter remanding the Forest Plan for revision, the Chief stated

"The range of alternatives needs to be expanded to include a lower timber program level, more acreage in uneven-aged management, and consideration of other silvicultural practices for even-aged management other than large block clearcuts "

The ID Team has formulated 14 alternatives to respond to the 13 issues (and 65 sub-issues) being addressed in the revision These alternatives have been formulated with a great deal of public involvement in an attempt to ensure that (1) a wide range of options for managing the Forest are being considered and (2) the alternatives are truly responsive to public issues

The discussion under the different sub-issues in *ADDRESSING ISSUES* describes how the different alternatives respond to the various issues and sub-issues

Sub-Issue 3. Inadequate "No Action" Alternative

This sub-issue contains substantive comments from a Forest Plan appeal on questions about the "no action" alternative in the Forest Plan EIS Page 225 of *ISSUES* contains a list of the substantive comments and a synopsis of comments

In the *Federal Register* of March 23, 1981, the Council on Environmental Quality (CEQ) published the "Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations" The response to the question "What does the 'no action' alternative include?" is reproduced in *ADDRESSING ISSUES*

The formulation of the "no action" alternative for the revision of the Forest Plan is complicated by the interim management direction provided by the Chief in his remand letter of September 6, 1989 To protect the rights of the appellants during interim management, the Chief placed a number of restrictions on the management direction to be followed while the Forest Plan is being revised Furthermore, both the Regional Forester and the Forest Supervisor agreed to additional restrictions The Forest has amended the Forest Plan to incorporate many, but not all, of the interim management restrictions A number of the restrictions (including allowable sale quantity) would require a significant amendment of the Forest Plan to become long-term management direction The Forest Plan would probably be revised before such a significant amendment could be completed

The ID Team was not able to obtain a legal interpretation of what the "no action" alternative should be in this instance The ID Team formulated two alternatives to determine what the differences would be in an alternative that strictly followed the Forest Plan as amended and an alternative that explored the continuation of interim management direction

ISSUE 12. ADEQUACY OF THE REVISION (Cont.)

Sub-Issue 3 Inadequate "No Action" Alternative (Cont)

The process record *Alternative #1 for Consideration in the Revision of the Land and Resource Management Plan for the George Washington National Forest* contains the formulation of an alternative based on the management direction in the Forest Plan, as amended. The ID Team found that the Forest Plan, as amended, would require the incorporation of different standards to comply with existing laws and policies. The Team also discovered that Alternative #1 could achieve an allowable sale quantity of 49 million board feet on a much smaller suitable land base than the suitable land base in the Forest Plan. The ID Team decided to drop this alternative from further consideration since it was impractical to formulate an alternative that mirrored the amended Forest Plan.

The process paper *Alternative 2* contains the formulation of an alternative based on the continuation of interim management direction into the future This alternative also contains new standards that comply with existing law and policies The assumption behind adopting this as the "no action" alternative is that the *Land and Resource Management Plan for the George Washington National Forest* would have to be significantly amended to continue as the management direction for the Forest Such a determination is consistent with the remand of the Forest Plan

The process paper *Alternative 3* details an alternative that would provide a high level of responsiveness to the "deep ecology" issues of biodiversity and resource sustainability This alternative is also meant to serve as a minimal level alternative. The purpose of this alternative will be to compare the resource development alternatives with leaving the Forest in a naturally evolving state.

Sub-Issue 4. Errors in Analysis/Flaws in Economic Analysis Assumptions/Reliability of Data

This sub-issue contains substantive comments reflecting public and agency concerns over the adequacy of the economic analysis supporting the Forest Plan EIS Pages 226 thru 228 of *ISSUES* contains a list of the substantive comments and a synopsis of comments.

In his September 6, 1989 letter remanding the Forest Plan for revision, the Chief stated·

"The economic analysis in the current Plan is not sufficient to support the conclusions. The revision must meet current Forest Service standards related to economic evaluation. An aspect of this evaluation must be a reexamination of the recreation benefits attributed to closed logging roads The analysis will also necessitate a reconsideration of the acreage designated as suitable for timber management "

The ID Team has conducted the economic analysis required by the NFMA Regulations and Chapter 3 of the *Land and Resource Management Planning Handbook* in a manner that is sensitive to the issues raised in Forest Plan appeals and during supplemental analysis Discussions under the other issues in this Appendix describe some of the analytic care being exercised by the ID Team. Appendix B of this EIS contains a detailed disclosure of the analysis underlying the revision of the Forest Plan.

Sub-Issue 5 Not Responsive to Public Opinion

This sub-issue contains substantive comments reflecting public and agency concerns over the adequacy of public involvement in the planning process. Pages 229 and 230 of *ISSUES* contains a list of the substantive comments and a synopsis of comments

In his September 6, 1989 letter remanding the Forest Plan for revision, the Chief stated·

"Greater care must be given by the GWNF to assessing public opinion in identifying issues We believe the Forest has done an appropriate job in compiling numerical data; however, we are not confident in the discussion of these data both for issues identification as well as for support of the final product "

ISSUE 12. ADEQUACY OF THE REVISION (Cont.)

Sub-Issue 5· Not Responsive to Public Opinion (Cont.)

The revision of the Forest Plan has been designed to afford increased opportunities for public participation and involvement The ID Team has used the issues and concerns raised by the public and the agency to focus the revision effort so that the alternatives provide meaningful resolutions to these issues. The Forest meets frequently with interested and affected members of the public in an effort to increase public participation in the revision. The ID Team has involved the public throughout the revision process

The first section of this Appendix details the public involvement efforts used in identifying issues

A number of organizations are participating in the data collection and evaluation that must accompany any planning effort Examples are the Natural Heritage Programs for Virginia and West Virginia identifying and inventorying important biological areas, the University of Virginia and James Madison University helping to identify "old growth", and many individuals participating in the evaluation of roadless areas

To ensure that the public is more involved in the revision effort, employees of the Forest (including members of the ID Team) have been holding public meetings where issues have been frankly discussed These meetings have enabled the ID Team to better understand the nature and intensity of the issues and to identify possible resolutions of different issues

The ID Team recognized that it can formulate a wider range of alternatives by involving members of the public Different groups have assisted in conceptually describing alternatives that provided the best resolution to issues

After the basic goals and objectives of each alternative was clarified, different groups assisted in providing proposed management area allocations for Alternatives 3, 4, 5, 6, 7, 9, 11 and 13

Sub-Issue 6 Management Areas / Management Prescriptions

This sub-issue contains substantive comments reflecting public and agency concerns over the use of management areas and management prescriptions to provide adequate management direction in the Revised Plan Pages 231 and 232 of *ISSUES* contains a list of the substantive comments and a synopsis of comments

Generally, the Forest Plan defined a number of small and specific management areas and relegated most of the Forest to Management Areas 14 (General Forest Area), 15 (Low Productivity Land) or 16 (Steep Lands)

The process paper *Management Area Prescriptions* contains a breakdown of 22 management areas being used to define the alternatives operate under a "zone" principle where all lands on the Forest being managed under one specific management area prescription are incorporated into the same management area This zone concept entails more specific direction over the entire Forest, but it does not give specific management direction for small parcels of the Forest By definition, **management areas** are **"areas of the Forest with similar management objectives where compatible management prescriptions are applied."**

ADDRESSING ISSUES contains a brief description of these management areas and their management area prescriptions

Sub-Issue 7. Plan Implementation

This sub-issue contains substantive comments reflecting public and agency concerns over the implementation of the Revised Plan. Page 233 of *ISSUES* contains a list of the substantive comments and a synopsis of comments

Chapter 4 of the revised Plan contains a detailed explanation of how the Revised Plan will be implemented In particular, this chapter explains how many of the NFMA Regulations must be completed by site-specific analysis during project implementation

ISSUE 13. THE MIX OF GOODS AND SERVICES

Sub-Issue 1 Emphasize Multiple Uses Other Than Timber

This sub-issue contains substantive comments reflecting public concerns that multiple uses other than timber be emphasized in the Revised Plan Pages 234 thru 237 of *ISSUES* contains a list of the substantive comments and a synopsis of comments

The revision process explores opportunities for providing multiple uses other than timber through the mixture of management area prescriptions which are available for the formulation of any alternative The process paper *Management Area Prescriptions* contains a description of 22 management areas containing many management area prescriptions As described in *ADDRESSING ISSUES*, only nine management area prescriptions can be described as "emphasizing timber management" Three other management area prescriptions permit timber management, but with additional restrictions to provide safeguards for aesthetics Two other management area prescriptions permit the use of timber harvesting, but in a manner which is consistent with preserving the scenic and recreational quality of a wild and scenic river Four management area prescriptions permit the management of timber as a compatible practice with off-highway vehicle use One management area prescription permits the use of uneven-aged timber harvest methods in areas of dispersed recreation use. Twelve management area prescriptions explore the use of timber management to achieve wildlife objectives, but they more properly emphasize wildlife management

Sub-Issue 2 Emphasize Dispersed Recreation Use

This sub-issue contains substantive comments reflecting public concerns that dispersed recreation use be emphasized in the Revised Plan. Pages 238 thru 240 of *ISSUES* contains a list of the substantive comments and a synopsis of comments The Forest supports a traditional mix of dispersed recreation activities including backpacking, hiking, camping, horseback riding, driving for pleasure, hunting, fishing, and mountain biking

The ID Team is analyzing the supply and demand of dispersed recreation opportunities in the form of three kinds of ROS settings· semi-primitive non-motorized (SPNM), semi-primitive motorized (SPM), and roaded [containing both roaded natural (RN) and roaded modified (RM)]. These recreation opportunity spectrum classes are described in Appendix G Both acres and recreation visitor day (RVD) capacity are estimated for each ROS class for each alternative

It is extremely difficult to deal with concerns about specific kinds of dispersed recreation uses within the revision of the Forest Plan. The ID Team is using the supply and demand for the three kinds of ROS settings as the best way to display the types of settings and compatible practices that would be permitted on different parts of the Forest

The process paper *Dispersed Recreation Demand Analysis — George Washington National Forest* projects the anticipated demand for dispersed recreation opportunities by the three kinds of ROS settings on the Forest A summary of this information is presented in Table A-6.

Table A-6.
Anticipated Demand for Dispersed Recreation Opportunities

Future Periods	Roaded	SPM	SPNM
	Thousands of Recreation Visitor-Days		
1990-2000	1,392.9	104 0	63 1
2001-2010	1,542 0	113 1	67 7
2011-2020	1,704 8	123 9	73 5
2021-2030	1,876 3	134 2	78 7
2031-2040	2,002.1	141 3	82 7

The recreational opportunities afforded by the Forest under any alternative will be compared with the anticipated demand to determine if there is any "unmet" demand for recreational opportunities in the ROS classes

ISSUE 13. THE MIX OF GOODS AND SERVICES (Cont.)

Sub-Issue 3 Emphasize Wildlife Management

This sub-issue contains substantive comments reflecting public concerns that wildlife management be emphasized in the Revised Plan Pages 241 and 242 of *ISSUES* contains a list of the substantive comments and a synopsis of comments.

The opportunities for emphasizing wildlife management can consist of different mixtures of management area prescriptions which emphasize certain wildlife species or, by default, provide habitat for certain wildlife species. The conflict in the management of wildlife centers around whether game species or non-game species should be "emphasized" The management of game species has been understood for many decades and the application of management practices for the purpose of emphasizing game species is well understood The opportunities for non-game management, however, are more vague and indistinct The Forest Wildlife Biologist has coordinated with representatives of different agencies in the Commonwealth of Virginia and the State of West Virginia to gain a better understanding of the opportunities for non-game management and the effects of management practices on various non-game species

Table A-7 contains a listing of the anticipated demand for wildlife user-days for fish, game and non-game wildlife species This information is described in more detail in the process paper *Wildlife and Fish Demand for the George Washington N F*

Table A-7.
Anticipated Demand for Fish and Game and Non-Game Wildlife Species

Species	1990	2000	2010	2020	2030	2040
			Thousands of Wildlife User-Days			
Big Game·						
Black Bear	29	28	27	27	26	25
Deer	222	216	209	203	197	192
Turkey	104	101	98	95	92	90
Small Game·						
Grouse	23	22	21	21	20	20
Squirrel	100	97	94	91	89	86
Waterfowl	0 5	0 5	0.5	0 5	0 5	0 5
Non-Game	285	307	325	351	338	405
Fish·						
Coldwater	152	161	173	182	195	208
Warmwater	38	40	43	45	49	52

Sub-Issue 4 Emphasis on Developed Recreation Sites

This sub-issue contains substantive comments reflecting public and agency concerns over the management of developed recreation sites Pages 242 and 244 of *ISSUES* contains a list of the substantive comments and a synopsis of comments

The Forest contains 92 developed recreation sites with a capacity of 12,972 persons at one time These sites consist of campgrounds, picnic areas, boat ramps, swimming beaches, overlooks, amphitheaters and trails within developed recreation areas.

The estimated demand for developed recreation opportunities is contained in the process paper *Determining Developed Recreation Demand on the George Washington National Forest* Table A-8 displays the anticipated demand for the five decades of the RPA planning horizon

ISSUE 13. THE MIX OF GOODS AND SERVICES (Cont.)

Sub-Issue 4: Emphasis on Developed Recreation Sites (Cont)

Table A-8
Estimated Annual Demand for Developed Recreation Opportunities

Year	Thousands of RVDs
2000	480
2010	552
2020	632
2030	712
2040	780

Sub-Issue 5: Management of Special Uses

This sub-issue contains substantive comments reflecting public concerns over the management of special use permits (predominately utility corridors and electronic sites) on the Forest. Pages 245 and 246 of *ISSUES* contains a list of the substantive comments and a synopsis of comments.

ADDRESSING ISSUES contains a description of the special uses, utility corridors and communications sites on the Forest. With the exception of **Alternative 3**, alternatives retain the existing special uses, utility corridors and communications sites. **Alternative 3** retains the existing utility corridors and communications sites but places severe restrictions on their maintenance **Alternative 3** requires that special uses not compatible with management area objectives be terminated

Sub-Issue 6· Opposition to Grazing

This sub-issue contains substantive comments reflecting public concerns over the management of the existing Granger-Thye permits for grazing. Page 247 of *ISSUES* contains a list of the substantive comments and a synopsis of comments.

The Forest contains five areas (approximately 250 acres) along the South Fork of the Shenandoah River and Cedar Creek where authorized grazing has been the traditional use. *ADDRESSING ISSUES* contains a description of these areas.

The Granger-Thye grazing permits contain terms which permit a control on the number of livestock on each permitted area Management area prescriptions could be applied to the existing permit areas to eliminate livestock grazing.

ORGANIZATIONS CONTACTED	*METHOD OF CONTACT*
4X4 Four-Wheel Drive Club	Visit
American Rivers	Phone, Letter
Amherst County Board of Supervisors	Visit
Appalachian Forest Management Group	Letter
Appalachian Trail Conference	Phone, Visit
Appalachian Trail Southern Conference	Meeting
Audubon Society, Shenandoah Valley Chapter	Panel
Augusta County Board of Supervisors	Meeting
Augusta County Parks and Recreation	Phone
Baltimore Four-Wheelers	Visit
Bath Alleghany Rockbridge Electric Cooperative	Phone, Letter
Bergton Volunteer Fire Department	Visit
Blue Ridge Archery Club	Visit, Meeting
Blue Ridge Parkway	Letter
Boy Scouts of America	Visit
Bridgewater College - Forestry & Wildlife Class	Tour
Bridgewater Ruritan Club	Presentation
Capitol City Four-Wheelers	Visit
Central Shenandoah Planning Commission	Meeting
Charlie Co. CB Club	Visit
Clover Hill Volunteer Fire Department	Visit
Department of Natural Resources	Phone
Dabney College	Phone
Edinburg Lions Club	Presentation
Environmental Protection Agency	Phone
Effinger Ruritan Club	Presentation
Food Agriculture Committee	Meeting
Forestry Advisory Board, DLCC	Meeting
George Mason University - Center for Recreation	Letter, Visit
George Washington University	Field Tour
Harrisonburg Planning Commission	Phone
Headwaters Soil/Water Conservation-Staunton	Visit
Highland County Board of Supervisors	Visit
James Madison University - CCS Students	Visit
James Madison University - Environmental Education Class	Visit
Jefferson National Forest	Visit
Lexington Women's Club	Meeting
Lord Fairfax Soil & Water Conservation Dist.	Meeting
Masonic Lodge - Woodstock	Presentation
Massanutten Hunt Club	Visit
Merck Rod and Gun Club	Meeting
Mid Appalachian Interpretative Assn	Visit
Moorefield Examiner	Visit
National Forests in North Carolina	DG, Mail
National Forests in Texas	DG, Mail
National Forests of South Writers	Visit
National Rifle Association	Phone
Natural Resources Defense Council	Letter
The Nature Conservancy	Visit, Phone
North Virginia Community College	Meeting
Pleasant View Ruritan Club	Meeting
Potomac Appalachian Trail Club	Visit
Rich Hole Citizens Advisory Group	Visit
Roanoke Times	Phone
Rockbridge Area Conservation Council	Visit
Rockbridge Area Forestry and Wildlife Association	Meeting
Rockbridge Co Wildlife & Forestry Club	Meeting

ORGANIZATIONS CONTACTED (continued)	*METHOD OF CONTACT*
Rockbridge Trail Riders Association	Visit
St Mary's Wilderness	Visit
Shenandoah Bike Club	Phone
Shenandoah County Board of Supervisors	Meeting
Shenandoah County Health Department	Visit
Shenandoah County Planning	Visit
Shenandoah County Wildland/Urban Interface Committee	Meeting
Shenandoah University, School Teachers on Environment	Field Trip
Shenandoah Valley Soil & Water Conservation	Meeting
Shenandoah Valley Trail Riders	Meeting
Southeastern Game Association	Field Trip
Southeastern Silviculturists	Tour
Staunton Kiwanis Club	Meeting
Staunton Daily News-Leader	Phone
US Fish and Wildlife Service	Site Visit, Phone, Letter
UVA Committee on Acid Deposition	Visit
University of Virginia - Environmental Sciences	Letter
Upper Regional Park Authority	Visit
Virginia Department of Forestry	Letter, Meeting
Virginia Department of Game and Inland Fisheries	Visit, Phone, Letter
Virginia Federation of Garden Clubs	Meeting
Virginia Fiber Corporation	Phone
Virginia Forestry Association	Visit
Virginia Garden Club	Visit
Virginia Houndsmen	*Phone*
Virginia Division of Natural Heritage	Phone, Visit
Virginia Native Plant Society	Visit, Field Trip
Virginia Outdoor Writers Association	Presentation
Virginia Polytechnic Institute	Visit
Virginia Soil & Water Conservation District	Presentation
Virginians for Wilderness	Phone, Letters, Visits
Washington and Lee University	*Phone*
West Virginia Department of Forestry	Visit
West Virginia Department of Natural Resources	Visit
West Virginia Natural Heritage Program	Visit, Phone
West Virginia University	Phone
The Wilderness Society	Letter, Visit
The Woodstock Rotary Club	Visit

INDIVIDUALS CONTACTED	METHOD OF CONTACT
Dr. Martin Albert	Letter
Cong. Allen	Field Trip
Ray Allen	Phone
Roger Allen	Phone
Bev Ambler	
Dr. Justin Atkins	Phone
L. Atkins	Phone
Dennis Austin, Georgia Pacific	Phone
Webb Babcock	Phone
Michael Badger	Visit
Baer family adjoiners	Visit
Ms Robert Baker	Phone
Steve Bennett	Visit
Col. Bissel, Commandant VMI	Visit
Doug Blosser	Letter
Charles Bodie	Phone, Visit
Charles Boggs	Phone Call
Brent Botts	Phone
Lee Bowen	Phone, Visit
Scott Bowers	Phone
Bryan Bradley	Phone
Walt Bradshaw	Visit, Phone
Steve Brady	Phone
Ted Brenig, NBATC	Visit, Letter
Mike Brewer, AT Land Management Committee	Letter
Steve Bridge	Phone
Fitzhugh Brown	Letter
C.T. Bryant, Central VA Electric Coop.	Field Trip
Bruce Bytnar, BRPW	Letter
Lynn Cameron	Phone, Visit
Bruce Campbell, Massanutten Hunt Club	Visit
Ronald Campbell	Phone
Lyle Chestnut	Visit
Henry Christner, Richmond Times Dispatch	Call
Ed Clark	Phone, Visit
Ralph Clark	Phone
Bill Clinton, Louis Harris Asso.	Phone
Dale Cobb, Augusta Co Zoning and Planning	Meeting
Katrina Coffman	Letter, Visit
Kenneth Coleman	Visit
Milton Colvin	Visit
Jim Couch, Rockingham County Board of Supervisors	Phone
Ivey Cox	Letter, Phone
Robert G. Crockett, Westvaco	Visit
John Davis	Phone
Melissa Davis, Winchester Star	Field Trip
Mike Dawson	Visit, Phone
Edna Delgado	Phone
Ernest Dickerman	Phone, Visit
Kelly Downs	Letter
Don Driver, owner of adjoining land	Visit
Pat Dullett	Phone
Tom Eick	Phone
Alvin Estep	Phone
Bobby Estep	Phone
Joe Evans	Phone
D R Fairchild	Visit

INDIVIDUALS CONTACTED (continued)	*METHOD OF CONTACT*
Sarah Faulkner	Visit, Phone
Del Fawcett	Visit
Anita D Filson, Spencer & Filson Law Offices	Letter
Edgar Fitzgerald	Phone
Bill Foote	Visit
Herb Foster	Phone
Reed Franklin	Visit
Robert Frener	Letter
Vernon Garber	Visit
Tommy Gardin, Greenway Auction Co.	Phone
Claude Garrett	Phone
Clay Goodman	Letter, Visit
Sgt. Green, 229th Chemical Co., Nat'l Guard	Phone
William Green	Letter
Gary Griffith	Phone
Dick Grist	Phone
Daniel Hall	Phone
Crickett Hammond	Phone
Steven Hanes	Phone
John Hart, Stonewall Jackson Council (BSA)	Presentation
Howard Heideman	Letter
Dave Helfrich, Central VA Bicycle Club	Phone
Margaret Hines	Visit
David Hook	Phone
Diane Hydes, Moorefield Examiner	Field Trip
Bill Hughes	Visit, Phone
Robert Hutchens	Call
Individuals interested in gypsy moth conditions	Tour
Jerry Jenkins	Field Trip
Mike Jones	Phone, Letters
Greg Kelley	Visit
Shirley Kiger	Phone
Kenneth B Kirkham, Westvaco	Visit
Orvin Kiser	Visit
Kiwanis Club, Lexington	Presentation
Konnarock Crew Volunteers	Visit
Steve Krichbaum	Phone, Letters
Henry Lantham	Visit
Darrell Laurant	Phone
Bob Leach	Phone, Visit
George Lear	Phone, Visit
Chess Lee	Visit, Letter
Peter Lessing, West Virginia geologist	
Robert Lewis	Phone
Lyndel Loan	Phone
Pat Lockhart	Phone
Jim Loesel, Citizens Task Force	Phone, Visit, Letter
Reese Lukei	Visit
Wayne Martin	Letter
Dana McCarron	Visit, Phone
Mike McCormack, Natural Bridge ATC	Phone, Letter
James McDaniels	Phone
Milton McGrady, Dabney Community College	Meeting
Wayne Marshall	Phone, Letter
G. Wayne Martin	Letter
Rick Martin	Phone, Letter
Greg Matthew, Stonewall Jackson Council (BSA)	Presentation

INDIVIDUALS CONTACTED (continued)	*METHOD OF CONTACT*
Paul May, Massanutten Hunt Club	Phone, Visit
John Metzer	Visit
Greg Mick	Visit, Phone
Dan Miles	Phone, Visit
Larry Mohn, VDGIF	Letter, Phone
Richard Moring, Augusta Co Service Authority	Letter
Dr Robert Mueller	Phone, Visits, Letters
Mike Mulligan	Phone
Bob Munson	Phone
Harry Nash	Meeting
David Neese	Visit
Doug Nelson, Old Dominion ATC	Letter
News Editor Moorefield Examiner	Field Trip
Ted Norris	Phone
Congressman Jim Olin	Visit
M. Ernest Olmedo	Visit
Richard Osborne	Visit
Genie Ott	Letter
Tom Pack	Phone
William Painter	Phone
Betty Patterson	Phone
Larry Parker	Phone
Maynard Patterson	Letter, Phone
Charles Pierce	Visit, Phone
Vince Poling, Planner, Shenandoah County	Visit
John Preller, Friends-North River Watershed	Phone
Ronnie Raum	Visit, Training
Ernie Reed	Phone
Terrell Reid	Visit
Harvey Rexrode, Virginia Houndsmen	Phone
Charlie Robinson, BMW Riders of Central VA	Phone
Frank Root	Phone
Bill Ross, Yancey Lumber Co	Phone
Wayne Sanders	Phone, Visit
Robert Schlawin, Radford	Visit
Stuart Shaner, Amherst County Administrator	Letter
Freddie Simmons	Phone
Henry Smiley	Phone
Linwood Smith	Visit
Reb Stewart	Phone
Murrell Thomas	Phone
Roger Timbrook	Visit
Ron Tipton	Phone
David Tomlin, VA Tech	Visit
Ralph Tucker	Phone, Letter
Bill Veno	Visit
Brian Wakeman, ATC Liaison	Letter
Jim Walker	Letter
Joe Weeks	Field Visit
Ed West	Phone
Richard White, VA Horse Council	Letter
Dave Whitehurst, VDGIF	Phone
Delegate Vance Wilkins	Phone
Col Don Williams, VMI	Meeting
Chris Wire, Rockbridge Conservation Council	Phone
Allen Wolverton, Shenandoah Co Health Dept	Visit

INDIVIDUALS CONTACTED (continued)	*METHOD OF CONTACT*
Harold Woosley	Phone
YCC Youths	Visit
Timothy C Yeatts	Letter

ELECTED OFFICIALS, OTHER FEDERAL AGENCIES, STATE AND LOCAL GOVERNMENTS, AND INDIAN NATIONS CONTACTED BY LETTER	
Honorable John W Warner	Honorable L. Douglas Wilder
Honorable Charles Robb	Honorable Gaston Caperton
Honorable Robert C Byrd	Honorable Harley D. Staggers, Jr.
Honorable John D Rockefeller IV	Honorable L F Payne
Congressman James R. Olin	Shenandoah National Park
Honorable D French Slaughter	USDI-Environmental Protection Agency
Federal Energy Administration	USDA-Soil Conservation Service
US Department of Transportation	Virginia Soil/Water Conservation
Shenandoah Valley Soil/Water Conservation	Virginia Division of Forestry
Virginia Water Control Board	Virginia Corporation Commission
Virginia Highways/Transportation	VA Commission of Outdoor Recreation
Central Shenandoah Planning District	VA Dept of Agriculture/Commerce
Virginia Planning District 5	Virginia Planning District 7
VA Air Pollution Control Board	US Army District Engineer
Alleghany Co Planning Commission	Virginia State Parks
Amherst Co Planning Commission	Robert Tippeconnic, USDA-Forest Serv
Augusta Co. Planning Commission	Bath County Planning Commission
Frederick Co Planning Commission	Boutetourt Co Planning Commission
Highland Co. Planning Commission	Nelson Co Planning Commission
Harrisonburg, VA, Planning Commission	Page Co Planning Commission
Lexington, VA, Planning Commission	Rockbridge Co Planning Commission
Staunton Planning Commission	Rockingham Co. Planning Commission
Waynesboro, VA, Planning Commission	Shenandoah Co Planning Commission
Warren Co Planning Commission	Buena Vista, VA, Planning Commission
Clifton Forge, VA, Planning Commission	Covington, VA, Planning Commission
Hampshire Co ,WV, Planning Commission	Hardy Co , WV, Planning Commission
Monroe County-WV Planning Commission	Pendleton Co ,WV, Planning Commission

APPENDIX B
THE ANALYSIS PROCESS

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INTRODUCTION

Appendix B presents a technical discussion of the analysis process and computer models used in the Revision planning effort. The appendix focuses on the quantitative methods used to perform the analysis and documents how the analysis was done.

The Forest's major planning goal is to provide enough information to help decisionmakers and the public determine which combination of goods, services, and land allocations will maximize Net Public Benefits (NPB) The regulations (36 CFR 219) developed under the National Forest Management Act (NFMA) provide the analytical framework within which these decisions are made.

The NFMA and its regulations also state that the requirements of the National Environmental Policy Act (NEPA) and its regulations (40 CFR 1500-1508) must be applied in this analytic process The NEPA regulations require that the environmental effects of a proposed action and alternatives to that proposed action must be disclosed in an Environmental Impact Statement (EIS)

Information presented in this chapter supplements the broader and less technical descriptions included in the body of the EIS This discussion includes basic assumptions, modeling components and inputs, rules, methods, and constraints. Additional information and documents used in the analysis process are contained in the planning records The planning record in its entirety is incorporated here by reference

The results from the modeling process are estimates of what can be expected if alternatives are implemented and facilitate comparison of alternatives.

Overview of the Forest Planning Problem

In reviewing the thirteen issues and concerns raised by the public and agency employees, it became evident to the interdisciplinary (ID) team that the nature of the issues raised during the revision were quite different from the issues defined during the initial planning effort. During the 1980's, planners defined issues primarily in terms of the goods and services which could be produced in an economically efficient manner. During the 1990's, the emphasis has shifted from the production of goods and services to concern over the basic management of the land ("stewardship") The thirteen issues reveal that most of the major concerns revolve around what management practices are permissible on different parts of the Forest rather than what is the appropriate mixture of goods and services.

During the entire revision process, and particularly during the formulation of alternatives, the ID Team was sensitive to the fact that the concerns of some groups and individuals involve the quantities of goods and services produced while the concerns of others involve land stewardship

Due to magnitude (nearly 1 1 million acres) and complexity (22 Land Use designations — i e Management Areas), several analytical models were used.

1 A Version 2 FORPLAN computer model was used to simulate land allocations and provide information on outputs and costs.

2 An IMPLAN model was used to analyze how those outputs and costs affected the local economy

3 A GEOGRAPHIC INFORMATION SYSTEM (GIS) was used to perform some pre-determined allocations and to define management area prescription options based on the goals and objectives of the alternatives and resource inventories

The Planning Process

Land and resource management planning requires that processes formerly used to make individual resource decisions be combined into integrated management decisions It also requires that mathematical modeling techniques be used to identify the most economically efficient solution to meet the goals and objectives of any alternative.

The 10-step process defined in the NFMA regulations was followed This appendix is concerned with describing the analysis phase of this process which are steps 3, 4, 5 and 6 Steps 1, 2, 7, and 8 are described in Chapters 1 and 2 and Appendix A of this EIS Plan implementation and monitoring, steps 9 and 10, are discussed in Chapters 3 and 4 of the Revised Forest Plan. A brief discussion of this process follows

Identification of purpose and need Issues, Concerns, and Opportunities (Step 1) — The Forest ID team assessed changes in public issues, management concerns, and resource use and development opportunities since the Plan was initially developed and subsequently amended Appendix A of this EIS documents this step

Planning Criteria (Step 2) — Criteria are designed to guide the collection and use of inventory data and information, the analysis of the management situation, and the design, formulation, and evaluation of alternatives This step establishes guidelines for accomplishing the next five steps The Work Plan and other process records document this step

Inventory Data And Information Collection (Step 3) — The kind of data and information needed is determined in Step 2 based on the issues, concerns, and opportunities identified and the resulting assessment of the management situation and determination of what needs to change Data collection is part of normal Forest operations Existing data is used whenever possible and supplemented with new data, when practicable, if new data will contribute to more responsive analysis Data accuracy is continually evaluated Much of this data and background documentation is on file in the Planning (or Process) Records on file in the Supervisor's Office

Analysis of the Management Situation (Step 4) — This step consists of assessing the existing situation on the Forest and determining opportunities for resolving issues and concerns This information provides the basis for formulating an appropriate range of reasonable alternatives

This analysis brings existing information together, puts it into a total Forest perspective, and examines the range of possible situations to resource issues It examines supply potentials and market assessments for goods and services, and determines suitability and feasibility for meeting needs The FORPLAN model was used to address a number of specific questions, including questions surrounding below-cost timber sales

Other objectives of the analysis of the management situation include

- assessing current direction including a schedule of goods and services most likely to be provided if current direction is continued
- assessing demand for goods and services from National Forest lands
- determining if there is a need to change current management direction

Formulation of Alternatives (Step 5) — A reasonable range of alternatives is formulated according to NEPA procedures Alternatives are formulated to assist in identifying one that comes nearest to maximizing net public benefits (NPB) They provide for the resolution of significant issues and concerns identified in Step 1

The alternatives reflect a range of resource management programs Each identified major public issue and management concern is addressed in different ways in the alternatives The programs and land allocations in each alternative represent the most cost-efficient way of attaining the goals and objectives for that alternative Both priced and non-priced goods and services (outputs) are considered in formulating each alternative This entire step is discussed on pages B-38 thru B-68 of this appendix

Estimated Effects of Alternatives (Step 6) — The physical, biological, economic and social effects of implementing each alternative are considered in detail to respond to the issues and need for change

The FORPLAN model estimates many, but not all, of the economic and physical effects Other effects examined outside the model include ecological and social considerations Specifically, the analysis determines 1) direct effects, 2) indirect effects, 3) conflict with other Federal, State, and local land use plans, 4) other environmental effects, 5) socioeconomic effects within the Forest influence zone, 6) tradeoffs associated with various resource production levels and land allocations, and 7) mitigation measures (standards) for resource protection The effects of the alternatives are displayed in Chapters 2 and 3 of this EIS

Evaluation of Alternatives (Step 7) — Significant physical, biological, economic and social effects of implementing alternatives are used to evaluate each alternative and compare them with one another Typically, each alternative can be judged on how it addresses the significant issues, concerns and opportunities (ICO's) identified in Chapter 1 and Appendix A of the EIS Also, the alternatives are evaluated on how consistent they are with the recommended 1990 RPA program Chapter 2 of the EIS summarizes the comparisons of the alternatives with the ICO's

Preferred Alternative (Step 8) — The Forest Supervisor reviews the ID Team evaluation of each alternative and the public issues and concerns The Forest Supervisor then recommends a preferred alternative to the Regional Forester The Regional Forester either selects the Forest Supervisor's recommendation, another alternative, or modifies the alternative recommended by the Forest Supervisor This alternative is described as the *Preferred Alternative* in this EIS and is displayed as the Proposed Revised Forest Plan The Forest Service preferred alternative is first announced in the Abstract Section of this EIS Public comments are solicited and will be considered in the finalizing of the draft Revised Forest Plan and EIS

Plan Approval and Implementation (Step 9) — After the ID Team has reviewed public comments and incorporated any necessary changes into the EIS or Revised Forest Plan, the Regional Forester reviews and approves the Revised Forest Plan and Final Environmental Impact Statement A Record of Decision documents this step

Monitoring and Evaluation (Step 10) — The Revised Forest Plan establishes a system of measuring, on a sample basis, actual activities and their effects, and compares these results with projections contained in the Revised Forest Plan Monitoring and evaluation comprises an essential feedback mechanism to ensure the Revised Forest Plan is dynamic and responsive to change Chapter 4 of the Revised Forest Plan displays the Monitoring and Evaluation program

INVENTORY DATA AND INFORMATION COLLECTION (STEP 3)

The ICO's in Appendix A were an important basis for determining what data needed to be updated or collected and what effects would be evaluated Both existing data and new information were used in the revision of the Forest Plan Important data was either entered into Region 8's CISC data base or into GIS

Two basic types of information were needed to facilitate the analysis and development of alternatives The first consisted of information related to the classification of land into categories with unique properties This classification was based on attributes significant to the planning issues This type of information was tied directly to the map base In the case of the Forest, this map base was its GIS and CISC data bases

The second type of information is not directly tied to a map base but has more to do with the estimation of how land will respond to certain management activities within a given alternative This can be viewed as the goods and services discussed in EIS chapters 2 and 3 In linear programming, these are called production coefficients This type of information came from many sources Regional procedural handbooks, professional research studies, Master's theses, etc The most up-to-date and verifiable information was utilized for the Revision

Database Development

In 1991, a computerized Geographic Information System (GIS) was completed forestwide for the Forest GIS links natural resource data with spatial (map) information This linkage enabled valuable spatial analysis and rapid display of resource information for Forest planning Region 8's Continuous Inventory of Stand Conditions (CISC) data base was also used

Inventories were continually updated to reflect current conditions and verification of existing information was an on-going effort

Updating the Visual Quality Inventory

The first Visual Quality Objective (VQO) inventory was completed in 1980 In 1990 and 1991, the Forest completed an extensive and detailed review of all factors involved in the derivation of the inventory The inventory was completely remapped to reflect the most current situation This has been accurately translated into the Geographic Information System for analysis and display

Issue 7, subissue 1 of Appendix A concerns the accuracy of the VQO inventory in the Forest Plan

District personnel knowledgeable of the on-the-ground conditions mapped the VQO under guidance of the Forest' Landscape Architect Both the methodology and results were reviewed by Landscape Architects from the Regional Office

During the inventory review process, Landscape Architects on the Forest worked with individual citizens, citizens groups, knowledgeable Ranger District personnel, Virginia and West Virginia State agencies, County officials, and personnel from the adjoining Jefferson and Monongahela National Forests In this process, oversight guidance and review was provided by Regional Office Landscape Architects Areas of disagreement about the inventory represent one percent or less of the land base of the Forest This is within a reasonable margin of error in the Forest's professional judgment Considering the intensive and thorough scrutiny that has been made, the inventory is considered as accurate and appropriate as practicable

GIS Data Layers

Many different physical, biological, or administrative layers or resource related information are contained in the Geographic Information System The compilation of the various inventories into the GIS mapping system resulted in more than 20 layers of land attribute and management opportunity delineations. These layers formed the basis for the resource data used for programmatic analysis. Table B-1 shows the data, stored in GIS, that were used in the formulation and Effect's Analysis of the alternatives

Table B-1.
GIS Data Information Used in the Revision

Common Name	GIS Data Layer Name
1) Ownership	Forest-LAL
2) Land Adjustment Program	Land-Adjust
3) Roadless Areas	RDLS-Areas or MOD_RDLSID
4) Existing Roads	Roads-Trails
5) Powerlines and Electronic Sites	Elec-Sites
6) Perennial and Intermittent Streams	Streams-3rd
7) Timber stands	Stands
8) Trails	Roads-Trails
9) Visual Resource Inventory	VQO
10) Recreation Opportunity Spectrum Inventory	ROS
11) Current Featured Species	FEA-SP
12) Research Natural Areas	LM-Areas
13) Original Plan Management Areas	LM-Areas
14) Geologic Areas	ALT6-4C
15) Eligible Wild, Scenic, and Recreation Rivers	WS-RVRS
16) Potential ATV areas	ATV-Areas
17) Appalachian Trail	AT-CORR
18) Existing Wilderness	LM-Areas
19) Potential Wildlife Habitat Situations (VDGIF and WV DNR)	VDGIF-Areas
20) Potential Wildlife Habitat Situations (Forest Service Biologists)	BOBS-Areas
21) Areas w/ Concentrations of Quality Timber	TIMB10-Only or TIMB12-Only
22) Highly Roaded Areas	High-Roads
23) Known Federal or State, listed or proposed, threatened, endangered or sensitive plant or animal habitat (Special Biological Niches)	SBN-Areas
24) Alleghany Front Lease Area	MIN-Areas

For a detailed report on the source and data of these layers, consult the Forest Resources Information Management Data Dictionary.

These layers provided all of the information necessary to develop and analyze the alternatives.

SOURCES OF DATA

The major data sources used in the planning process are the Geographical Information System (GIS) data base, CISC data base and studies conducted to determine output values and cost coefficients All coefficients and assumptions made in the modeling process have been developed from the following information sources.

General

1) Animal habitat, Codes and definitions for many of the activities, outputs, and effects came directly from the National Activity Structure Handbook (FSH 1309.16)

2) Virginia Department of Labor and the Forest Service IMPLAN Model were used to estimate future regional employment and income by resource.

Timber

1) *The Continuous Inventory of Stand Conditions (CISC) is the standard data base for the Southern Region Forest Service Handbook-* FSH 2409 26d displays information and coding structure for CISC. CISC provided specific timber information for each land unit or stand on the Forest CISC was used in the analysis area (AA) identification process, and for determining land not appropriate for timber *production It will continue to be used for monitoring.*

2) Historical timber sales data from the years 1987 to 1991 was taken from 2400-17 forms and from sales contracts. Data used in the analysis included data on stumpage prices (statistical high bid), volume per acre, number of bidders, product sold, operable acres, site preparation method and cost, and reforestation costs. Sales contracts provided cruise data specifying volume per acre. Cruise data on yields was used in conjunction with documented research to formulate yield tables for use in the FORPLAN model Economic data used in the model included average statistical high bid and per-acre costs for site preparation and reforestation

3) Timber prices were determined using timber appraisal summaries for the Forest The mid-market timber values were calculated using the quarterly Cut and Sold Reports for the Forest.

4) The costs attributed to harvesting timber have been calculated using actual cost expenditure reports averaged from several years

5) Timber yields were based on the timber type and standing volume from continuous Forest re-inventories.

6) Yields for regenerated timber stands were derived from permanent study plots and published research

Road Construction and Reconstruction Activities

1) Road construction and reconstruction costs are based on actual road expenditures

2) Estimated road construction miles are based on a paper discussing the harvest-transportation planning for a 30% sampling of Forest Transportation Analysis Units (TAUs) Estimated road reconstruction miles are assumed to be essentially equal to the new construction miles on an average yearly basis, since from the years 1989 - 1991, new road construction totaled 30 5 miles and reconstruction totaled 32 6 miles

Soil and Water

1) Background water yields for the Forest were calculated using records from USGS gauging stations on, or near, the Forest

2) Increases in water yields were developed using procedures in the Region 8 *Procedure for Preparing Soil Loss, Sediment Yield, and Water Yield Estimates for Forest Plans* (1981).

3) Soil loss and sediment rates from both natural sources and management activities were developed according to procedures in the above Region 8 paper (1981), using coefficients from *Predicted Erosion Rates for Forest Management Activities in the Southeast* (Dissmeyer and Stump, 1978) Coefficients were applied to the Universal Soil Loss Equation, as outlined in *An Approach to Water Resources Evaluation of Non-Point Silvicultural Sources* (USDA Forest Service, 1980)

4) Erosion rates for roads were derived from research (Ursic and Douglass, 1978, Kochenderfer and Wendel, 1980), as adapted for Forest conditions

5) Sediment delivery ratios (the percentage of soil loss that reaches a stream as sediment) were taken from Roehl's graph relating drainage area to sediment delivery (Roehl, 1962)

Recreation

1) Developed recreation data in the FORPLAN model are based on capacity Capacity data were taken from information contained in the Forest Recreation Information Management (RIM) system RIM data were also used to assess the demand for, or use of, developed and dispersed recreation capacity.

2) Recreation values were the same as 1990 Final RPA Values

3) The cost of providing and maintaining recreation opportunities on the Forest have been calculated using actual Forest Service cost information

4) Recreation capacity figures were estimated using the procedures outlined in the Recreation Opportunity Spectrum Users Guide (ROS) (Forest Service Handbook (FSH) 2309 13)

5) Recreation use information and RPA indices were used to calculate future recreation demand by ROS

Wildlife and Fish

1) National Forest Hunting and Fishing Stamp Sales data as supplied by Virginia Department of Game and Inland Fisheries (VDGIF) and the West Virginia Department of Natural Resources (WVDNR).

2) Hunting harvest figures for big game and small game as supplied by VDGIF and WVDNR

3) Wildlife capacity coefficients were calculated through the use of Habitat Capability Models (developed by interagency task forces) for some of the management indicator species.

4) Benefits derived from wildlife are the same as the 1990 RPA Values.

FOREST PLANNING MODEL

FORPLAN, Version II, was the analytical tool utilized in the analysis Version II was selected due to the ease of data entry and greater capability and versatility over that of the Version I model used for the original Forest Plan FORPLAN was used to analyze numerous management area prescriptions and activity schedules and their potential for achieving the objectives of each alternative

FORPLAN, a "linear program" model, is designed to simulate the actions of the different resources, management, and environmental conditions on the Forest It is also designed to find the "optimum" solution to a problem posed by the potentials and limitations of the land and resources, the effect of costs, budgets, and resource prices, and the desired objectives of resource yields and environmental conditions.

The FORPLAN model is structured to seek the greatest economic efficiency (the most return for an investment), which is represented as a "maximize PNV" objective function ("PNV" or "present net value" is the current net value of the estimated flow of present and future monetary costs and benefits) FORPLAN is able to estimate Forest-wide effects, monetary costs and benefits under the conditions specified to achieve the objectives of a particular alternative

The ID team was directly involved with the design, operation, and interpretation of the FORPLAN model Utilizing the identified analysis areas, appropriate management practices and associated mathematical expressions, the ID team constructed the Forest model.

In the FORPLAN Model, the outputs modeled were chosen because of their relationship to the issues, concerns and opportunities Other outputs and effects were estimated outside of the FORPLAN model or by interpreting the results of the FORPLAN solution

FORPLAN was used to determine the cost efficient mix of goods and services that could be produced from the Forest, given the objectives and constraints of each alternative The trade-offs made among alternatives were also examined

The linear program is driven by the objective function which is achieved or satisfied, subject to a series of constraints. Possible allocation and scheduling choices are evaluated on the basis of both commodity and noncommodity values with allocation decisions being based on an assessment of the relative values of each Allocation refers to the preferred use to which a given piece of land is assigned. Once allocated, management activities are scheduled that are compatible with the preferred use.

The objective function drives the allocation and scheduling process and defines the purpose of the run It specifies an output(s) to be maximized or minimized For example, an objective function could specify the maximization of water yield or present net value Allocation and scheduling choices within the model are then made in accordance with the purpose stated in the objective function.

As the term indicates, constraints are conditions or restrictions that determine which course of action can or cannot be adopted In a linear programming problem, conditions or restrictions defined by constraints are satisfied prior to optimization of the problem in the manner specified by the objective function. If a course of action that satisfies all of the constraints does not exist, the problem is infeasible. In this case, the constraints must either be relaxed or reformulated or the problem redefined to allow an optimal solution to be found.

In the FORPLAN model, constraints were imposed for several reasons There were constraints imposed to satisfy legal and policy related requirements Examples of these are the nondeclining yield constraint (policy) and constraints to provide habitat for the common flicker, a management indicator There can also be discretionary constraints imposed in order to achieve the objectives that define an overall management philosophy or alternative For example, in the CURRENT alternative, there are timber harvest constraints imposed to reflect the current level of timber harvest These constraints prevent the linear program from simulating timber harvest in an amount greater than the currently being produced This, then, is a discretionary constraint that is imposed in order to reflect an overall approach to management.

FORPLAN simulates the physical characteristics of the land, the activities used to manage that land, and the outputs, costs, and benefits associated with the activities The land base is represented by analysis areas, allocation and scheduling choices are offered to analysis areas in the form of management prescriptions Output (yield) and cost/benefit coefficients are contained in resource yield tables and economic tables respectively The primary components of the FORPLAN model include analysis areas, management prescriptions, resource yield tables, economic tables, objective function, and constraints

Each of these individual components of the FORPLAN model on the Forest are discussed in greater detail later in this chapter

ANALYSIS OF THE MANAGEMENT SITUATION (STEP 4)

Prior to the formulation of alternatives, the ID Team performed seven steps

1. delineation of capability areas,
2 identification of analysis areas,
3 development of management requirements,
4 selection of management area prescriptions,
5 determination of demand estimates;
6. identification of lands tentatively unsuitable for timber production,
7 exploration of opportunities to respond to issues

Delineation of Capability Areas

Capability areas are defined as contiguous units of land having similar geological, climatic, and resource characteristics Responses to treatment are expected to be relatively the same throughout the area Costs of treatment are also expected to be relatively uniform Capability Areas are synonymous with "stands" as defined by CISC.

Capability areas or stands represent lands delineated to estimate responsiveness to various management practices, resource values, output coefficients, and multi-resource or joint production functions

Identification of Analysis Areas

Based on information needed to address issues and concerns, capability areas were aggregated into analysis areas Analysis areas are defined as areas of land (stands), not necessarily contiguous, which can be considered to be homogeneous with respect to responses to treatment in terms of yields, costs of treatments and values received for resource outputs At the time of analysis area identification, the GIS data base was not operational Forest-wide Therefore, individual stand data from the CISC data base were used to define analysis areas

Each analysis area is composed of similar stands, with similar vegetation and representing similar opportunities Overlaying all of the identified layers from GIS and CISC would have resulted in thousands of analysis areas Grouping was used to aggregate and condense these into the minimum number of areas that still retained sufficient site-specificity to analyze resource allocation and scheduling options needed to address issues The result was the stratification of the Forest into 122 analysis areas

The ID Team faced two problems during the identification of analysis areas· limitations on the number of analysis areas that could be placed in the FORPLAN model and the need to update certain resource inventories. The ID Team resolved these problems by creating a special Oracle CISC data base which could be used to further analyze the analysis areas in terms of resource information not directly included in the analysis area identifiers in FORPLAN The factors used in identifying the analysis areas were limited to those that (1) were most responsive to a large range of issues and (2) where the inventory was not in question

1 Development Process

Each analysis area was defined by six levels of identifiers with respective categories Each land unit or stand displayed in the resource date base (CISC II) was assigned to a specific analysis area based upon that stand's unique characteristics The analysis area acres in FORPLAN are an aggregation of the stand acres from CISC II

Once the identifiers were determined, the CISC data base was updated Given the characteristics of the analysis areas, an AA identification number was assigned to each stand in the data base The data base was then queried to determine the number and acres of each analysis area

These six levels of identifiers were developed from the issues in Appendix A of this EIS They are summarized below.

a *LEVEL 1 — FORESTWIDE.* An Identifier (SO) was used for a dummy analysis area to keep track of Forest-wide costs and outputs

b *LEVEL 2 — TENTATIVELY SUITABLE LANDS* This identifier recognizes those lands physically unsuitable and suitable for timber production Physically unsuitable lands are. developed recreation sites; research natural areas; wilderness, unproductive forest land, physically unsuited land including forest land blocked by physical barriers, and non-forest land including utility corridors The remaining forested land is considered as physically suitable for timber production

c *LEVEL 3 — ROS.* The existing inventoried Recreation Opportunity Spectrum (ROS) Classes were stratified into three categories of Semi-Primitive Non-Motorized, Semi-Primitive Motorized, and Roaded Natural ROS delineation criteria consider the existing transportation system

d *LEVEL 4 — WORKING GROUPS·* This is the same identifier used in the original planning process The following categories should be self-explanatory as to their necessity The timbered sites were necessary for determining such requirements as land suited for timber production and long-term sustained yield They were also necessary to address the issues raised regarding below-cost timber sales and the amount and method of harvesting The existing forest types were stratified into four categories of Upland Hardwoods, Cove Hardwoods, White Pine, and Yellow Pine / Virginia Pine

e *LEVEL 5 — PRODUCTIVITY/SLOPE CLASS* This is a combination of identifiers used in the original planning process Slope greatly influences road and logging costs. Slope Class was stratified into two groupings of steep and low slopes The existing stands were stratified into five categories related to the potential production capability Low productivity lands (site index 40) were one of the five categories

f *LEVEL 6 — CONDITION CLASSES* This is the same identifier used in the original planning process The existing forest stands were stratified based upon their condition of seedling/saplings, immature, mature, and damage/sparse/low quality.

The above criteria originally resulted in 148 analysis areas. This was reduced to 122 by combining all analysis areas less than 500 acres with larger areas The procedure was done manually grouping similar condition classes

Table B-2 displays the coding structure of FORPLAN, Version II, for the analysis areas depicted above The information within () is the CISC II data base codes used for each identifier

Table B-2
FORPLAN Analysis Areas

FORPLAN Codes	Coding Structure	Definition
*** LEVEL1**		**FIXED COSTS**
SO	S O	***Supervisor's Office***
*** LEVEL2**		**TENTATIVELY SUITABLE LANDS**
NF	NONFOR	**Non-Forest Land** (LNCL = 200-260)
WD	WILDNS	**Existing Wilderness** (MGMT_AREA = 02)
LL	LITTLE	**Existing RNA's** (MGMT_AREA = 01)
UN	UNPROD	**Unproductive Forest** (LNCL=900 or FRTY=99 and STCN = 15)
PB	PHYUNS	**Physically Unsuited Land** (LNCL = 826)
DV	DEVREC	**Existing Developed Recreation Sites and Water** (LNCL = 100-140 or 850)
RF	SUIT	**Remaining General Forest**
*** LEVEL3**		**ROS CLASSES**
PP	SPNM	**SemiPrimitive Non-Motorized** (ROS = P or SPNM)
SP	SPM	**SemiPrimitive Motorized** (ROS = SPM)
RN	RN	**Roaded Natural/Rural** (ROS = RN)

FORPLAN Codes	Coding Structure	Definition
*** LEVEL4**		**WORKING GROUPS**
UP	UPLNHW	**Upland Hardwoods** (FRTY = 42-49,51-54,57-60)
CV	COVEHW	**Cove Hardwoods** (FRTY=41,50,55,56,81,82,88,17,71-73,76)
WP	WHITEP	**White Pine** (FRTY = 03-10)
YV	VA/YP	**Virginia & Yellow Pine** (FRTY=12,15,20,32,38,39,16,33, 02,13,31,35)
*** LEVEL5**		**PRODUCTIVITY/SLOPE CLASS**
1<	PCI<	**Low Slope/Productivity Class I** (LNCL not equal to 540-549, 821, and WORKING GROUP = White Pine)
3<	PCIII<	**Low Slope/Productivity Class III** (LNCL same as above and WORKING GROUP = Upland hardwoods and MGTY_SITE_CODE = 70+ or WORKING GROUP = Cove hardwoods)
4<	PCIV<	**Low Slope/Productivity Class IV** (LNCL same as above and WORKING GROUP = Upland hardwoods and MGTY_SITE_CODE = 60 or WORKING GROUP = Virginia and Yellow Pine
5<	PCV<	**Low Slope/Productivity Class V** (LNCL same as above and WORKING GROUP = Upland hardwoods & MGTY_SITE_CODE = 50)
L<	LOWPR<	**Low Slope/Low Productivity Forest Land** (LNCL same as above and WORKING GROUP = Upland hardwoods and MGTY_SITE_CODE = 40)
1>	PCI>	**Steep Slope/Productivity Class I** (same as 1< except LNCL = 540-549, and 821)
3>	PCIII<	**Steep Slope/Productivity Class III** (same as 3< except LNCL = 540-549, and 821)
4>	PCIV<	**Steep Slope/Productivity Class IV** (same as 4< except LNCL = 540-549 and 821)
5>	PCV<	**Steep Slope/Productivity Class V** (same as 5< except LNCL = 540-549 and 821)
L>	LOWPR<	**Steep Slope/Low Productivity Forest Land** (same as L< except LNCL = 540-549 and 821)
LS	LOW	**Low Slope/All Productivity Classes** (only applies to Damaged, Sparse or Seed/ Sap condition classes STCN = 01,02,03,04,05,06,13,14,15 LNCL not equal 540-549,821)
HS	HIGH	**High Slope/All Productivity Classes** (only applies to Damaged,Sparse or Seed/ Sap condition classes STCN = 01,02,03,04,05,06,13,14,15 LNCL equal to 540-549,821)
*** LEVEL6**		**CONDITION CLASSES**
MU	MATURE	Mature (STCN = 08,09,10,16)
IM	IMMATU	Immature(STCN = 07,11,12)
SS	S/S	Seedlings and Saplings (STCN = 01,13,14,15)
DS	DS	Damaged/Sparse (STCN = 02,03,04,05,06)

2 Data Base (CISC II) Fields

Table B-3 displays the data base fields considered necessary for the revision analysis Data related to the timber resource and basic acreage figures have already been entered into the data base Additionally, CISC II was updated with the Forest Plan special management areas and ROS These two fields were necessary since they were analysis area identifiers

Table B-3.
CISC Data Used in the Revision

Field Name	Definition	Unit of Measure
DIST_NO	*District Number*	*Stand Identifier*
CMPT_NO	Compartment Number	Stand Identifier
STND_NO	Stand Number	Stand Identifier
LNCL	Land Class	Political and Admin Data
FRTY	Forest Type	Forest Cover Types
MGTY_SITE	Management Type Site Index	Productivity Classes
STCN	Stand Condition Class	Forest Size Classes
ACRES	Stand Acres	Physical Data-Acres
WDLF	Wildlife	Featured Species Name
MGMT_AREA	Management Area	Plan Management Area
ANAL_AREA	Analysis Area	Analysis Area Number
ROS	Recreation Opport Spectrum	ROS Classes

Selection of Management Prescriptions

The ID Team worked with the public in a series of meetings to define the possible management area prescriptions that could be applied to any alternative. The initial formulation of management prescriptions is discussed in the January 24, 1991 process paper entitled *Management Prescriptions to be Used in the Revision of the Land and Resource Management Plan for the George Washington National Forest* The process paper *Management Area Prescriptions* contains a detailed description of the final management area prescriptions that were available to formulate alternatives Also, a process paper *Summary of Management Area Prescriptions* contains a brief summary of each prescription

Management area prescriptions can be viewed as different choices for a particular piece of land. These choices develop and/or protect some combination of resources Each choice addressed a public issue a different way. For example, one issue on the Forest is whether timber harvesting should occur in those areas currently delineated for semi-primitive non-motorized recreation (SPNM ROS Class). Different management prescriptions can address this particular issue in different ways. One prescription might allow timber harvesting by any timber harvest method thereby "adopting" a roaded natural (RN) or roaded modified (RM) ROS designation Another prescription might limit timber harvesting to uneven-aged timber harvest methods and and even-aged methods other than clearcutting thereby adopting a semi-primitive (SPM) ROS designation. A third prescription might prohibit timber harvesting and retain a SPNM ROS designation

EIS alternatives having similar goals and objectives for some resources may differ widely (apply different management area prescriptions on the same portions of the Forest) in how those goals and objectives are achieved Analysis will eventually determine the combinations of management area prescriptions that best achieve the goals and objectives of any alternative Let's suppose a similar goal in two alternatives is to "meet timber demand" while the main emphasis of one alternative (Alt A) is wildlife and recreation and the main emphasis of the second alternative (Alt B) is timber Analysis may result in recreation and wildlife-oriented prescriptions being more heavily allocated in alternative A than alternative B Little or no allocation would be given to the timber-oriented prescriptions in alternative A Timber harvesting would still occur to meet the similar goal, but the driving force behind timber management would be the recreation and wildlife goals of the alternative The costs, type of species harvested, and the method and timing of harvests may be different in alternative A By having a variety of management area prescriptions, the Forest was able to show the public the tradeoffs in costs, benefits and outputs associated with the different alternatives

The variety in prescriptions has been specifically developed to ensure that a broad range of public views is available for consideration within and between alternatives Since public views centered on four resources (recreation, wildlife, water, and timber), the range of emphases developed focused on these

From the technical aspect, the NFMA regulations define management area prescriptions as "management practices selected and scheduled for applications on a specific area to attain multiple use and other goals and objectives." They are combinations of management practices, the timing of those practices and associated costs and benefits

Practices represent, to the extent possible, the most cost efficient means of meeting each prescription's emphasis The ID team believes the range of management area prescriptions is broad enough to address the issues and define alternatives in the EIS Management prescriptions represent not only the most cost efficient mix of practices, but also the current mix as well as some creative mixes to achieve the objectives of each management emphasis.

Prescription development centered on providing a full range of choices to address important issues surrounding the following subjects

Visual Quality Objectives	Recreation Opportunity Spectrum
Even/Uneven-age Silvicultural Systems	Non-timber Practices Allowed
Featured/Management Indicator Species	Open vs Closed Roads
Clearcut Size	ORV/ATV Use
Hardwood to Pine Conversion	Timber Harvest Methods
Motorized vs Nonmotorized Access	Rotation Lengths

To be able to analyze the different management area prescriptions, it was necessary to model them as management prescriptions within FORPLAN For discussion purposes management area prescriptions and management prescriptions are synonymous. The term **management area prescription** refers to the written prescription as it would appear in a Forest Plan The term **management prescription** is used to refer to the FORPLAN modeling of the management area prescription.

In the FORPLAN model, analysis areas can be allocated to one or more management prescriptions. Management prescriptions in FORPLAN consist of (a) a management emphasis (such as remote wildlife species), (b) a management intensity (such as uneven-aged management using group selection), (c) an option on when to implement or timing choice (first through fifteenth decade), (d) predicted resource yields (or outputs), (e) the value of the resource yields and (f) the cost of implementing the management prescription

The number of management prescriptions continually changed throughout the process Just considering the emphasis/intensity combinations resulted in over 100 prescriptions being developed If one were to introduce all the timing choices available over 15 decades, the number grows exponentially into the thousands.

These prescriptions represent a range of management direction, intensity, practices, and standards. Necessary mitigation measures and resource coordination measures that are required to satisfy economic, legal, and social constraints were included Based on the number of standards (discussed later in this section) that vary by prescription, the Forest feels confident that a broad range of prescriptions was available for the analysis

Summary of Management Area Prescriptions

The following is a brief description of the Management Area Prescriptions used in developing the alternatives

Management Area Prescription 1A contains portions of the Forest which are unsuitable for timber production and are not needed to achieve multiple use objectives

Management Area Prescription 1B contains portions of the Forest which are managed at a minimal level to reduce federal expenditures and to provide primitive, dispersed recreation opportunities [*Management Area Prescription 1B* is only used in **Alternative 3**]

Management Area Prescription 2A consists of migration corridors that connect remote areas of the Forest.

Management Area Prescription 2B consists of wide migration corridors that connect large wilderness. [*Management Area Prescription 2B* is only used in **Alternative 3**]

Management Area Prescription 3A contains those areas on the Forest where watersheds are in a degraded hydrologic condition requiring special protection.

Management Area Prescription 3B contains municipal watersheds receiving special protection.

Management Area Prescription 4A consists of those areas of the Forest which are designed as biological areas Formal classification of these areas as Botanical or Zoological Areas occurs concurrently or shortly after adoption of the Final Revised Forest Plan If a national or state classification system is established to protect areas of concern for biodiversity, these areas would be nominated for this designation Where appropriate, special management direction is provided for individual areas.

Management Area Prescription 4B consists of those areas of the Forest which are designated as historical areas Formal classification of these areas as Historical Areas occurs concurrently or shortly after adoption of the Final Revised Forest Plan Where appropriate, special management direction is provided for individual areas

Management Area Prescription 4C consists of those areas of the Forest which are designated as geological areas Formal classification of these areas as Geological Areas occurs concurrently or shortly after adoption of the Final Revised Forest Plan Where appropriate, special management direction is provided for individual areas.

Management Area Prescription 4D consists of the Little Laurel Run Research Natural Area This management area prescription does not apply to the Ramseys Draft Research Natural Area which is part of Management Area 8 This management area prescription can be applied to other parts of the Forest which might qualify for Research Natural Area designation Formal classification of these areas as Research Natural Areas can only be made by the Chief of the Forest Service following the formal study and recommendation by the Regional Forester

Management Area Prescription 4E consists of the lands managed to maintain, protect, and enhance the significant biological values of the Shenandoah Mountain Crest [*Management Area Prescription 4E* is only used in **Alternative 8A**]

Management Area Prescription 5A consists of areas of the Forest designated as Scenic Areas. Formal classification of these areas as Scenic Areas occurs concurrently or shortly after adoption of the Final Revised Forest Plan Where appropriate, special management direction is provided for individual areas

Management Area Prescription 5B consists of sensitive viewsheds on the Forest which are managed to maintain a natural viewshed

Management Area Prescription 5C is applied to portions of the Forest (outside of existing wilderness areas or areas recommended for wilderness study) that lie within 1/2 mile of open roads [*Management Area Prescription 5C* is only used in **Alternative 3**]

Management Area Prescription 5D contains primarily the visual middleground of the west face of Massanutten Mountain (a narrow strip) as seen from the Shenandoah Valley along Interstate 81. Generally, much of this area is very steep except at the ridge top and valley floor It is also inaccessible because of ownership of adjacent private land

Management Area Prescription 6A is applied to all or portions of the Appalachian Scenic Trail to protect, manage, develop, and use the Appalachian National Scenic Trail in accordance with the National Trails System Act (P L 90-543) and is carried out through the Cooperative Management System as defined in the Appalachian Trail Comprehensive Plan

Management Area Prescription 6B is applied to all or portions of the Appalachian Scenic Trail to protect the trail as an integral part of the wilderness-corridor system [*Management Area Prescription 6B* is only used in **Alternative 3**]

Management Area Prescription 6C is applied to all or portions of the Appalachian Scenic Trail to protect, manage, develop, and use the Appalachian National Scenic Trail in accordance with the National Trails System Act (P L 90-543) and under new standards developed by the Regional Recreation Staff Unit and representatives of the Appalachian Trail Conference [*Management Area Prescription 6B* is only used in **Alternative 8A**]

Management Area Prescription 7A consists of viewsheds or portions of viewsheds on the Forest that are suitable for timber production and are managed to meet a visual quality objective of retention

Management Area Prescription 7B consists of viewsheds or portions of viewsheds on the Forest that are suitable for timber production and are managed to meet a visual quality objective of partial retention

Management Area Prescription 7C consists of viewsheds or portions of viewsheds on the Forest that are unsuitable for timber production and are managed to meet a visual quality objective of retention

Management Area Prescription 7D consists of viewsheds or portions of viewsheds on the Forest that are unsuitable for timber production and are managed to meet a visual quality objective of partial retention

Management Area Prescription 7E consists of the foreground visual zone along the Highlands Scenic Tour

Management Area Prescription 7F consists of a small area middleground surrounded by the Highlands Scenic Tour which is managed to meet a visual quality objective of partial retention

Management Area Prescription 8A consists of existing wildernesses managed under the existing Wilderness Implementation Schedules

Management Area Prescription 8B consists of areas of the Forest qualifying as roadless areas under the Forest Service definition that are recommended for wilderness study designation

Management Area Prescription 8C is applied to existing wildernesses outside the core areas allocated to *Management Area Prescription 8E* [*Management Area Prescription 8C* is only used in **Alternative 3**]

Management Area Prescription 8D consists of areas of the Forest which are recommended for wilderness study designation outside the core areas allocated to *Management Area Prescription 8E*. As explained on page 2 of this document, these areas are created by eliminating system roads and making recommendations to revise the criteria in Chapter 7 of the *Land and Resource Management Planning Handbook* (FSH 1909 12) [*Management Area Prescription 8D* is only used in **Alternative 3**]

Management Area Prescription 8E consists of portions of existing wilderness or areas of the Forest recommended for wilderness study designation that are managed to retain the most primitive and pristine conditions possible [*Management Area Prescription 8E* is only used in **Alternative 3**]

Management Area Prescription 9A contains portions of the Forest that are managed to provide older vegetation in remote and isolated areas where recreationists can obtain a degree of solitude and the environment can be maintained in a near, natural state with minimum intervention

Management Area Prescription 9B consists of remote areas of the Forest that are managed as "Remote Highlands"

Management Area Prescription 9C consists of remote areas where recreationists can obtain a degree of solitude

Management Area Prescription 10A consists of managing segments of rivers that qualify for scenic river designation in a manner that retains qualities that qualify them for such designation

Management Area Prescription 10B consists of managing segments of rivers that qualify for recreational river designation in a manner that retains qualities that qualify them for such designation.

Management Area Prescription 10C consists of managing acreage within the segments that qualify for scenic river designation in a manner that maintains a higher quality of standard than needed for scenic river designation

Management Area Prescription 10D consists of managing acreage within the segments that qualify for recreational river designation in a manner that maintains a higher quality of standard than needed for recreational river designation The one river segment that qualifies for wild river designation (the St Mary's River) lies within the St Mary's Wilderness *Management Area Prescription 8A* provides management direction that protects the values of a wild river designation

Management Area Prescription 11A consists of lands which are unsuitable for timber production with a visual quality objective of partial retention

Management Area Prescription 11B consists of lands which are suitable for timber production where uneven-aged timber harvest cutting methods can be applied with a visual quality objective of partial retention

Management Area Prescription 11C consists of lands which are suitable for timber production where even-aged timber harvest cutting methods can be applied with a visual quality objective of partial retention

Management Area Prescription 11D consists of lands which are unsuitable for timber production *Management Area Prescription 11D* includes riparian areas within areas of Management Area 11 that are unsuitable for timber production [*Management Area Prescription 11D* is only used in **Alternative 4**]

Management Area Prescription 11E consists of lands which are suitable for timber production where even-aged timber harvest cutting methods can be applied *Management Area Prescription 11E* applies Virginia and West Virginia Best Management Practices to riparian areas [*Management Area Prescription 11E* is only used in **Alternative 4**]

Management Area Prescription 11F consists of lands which are unsuitable for timber production with a visual quality objective of retention

Management Area Prescription 11G consists of lands which are suitable for timber production where even-aged timber harvest cutting methods can be applied with a visual quality objective of modification

Management Area Prescription 12A consists of minimally developed sites which would be managed at a "reduced service level".

Management Area Prescription 12B consists of highly developed sites which would be managed at a "reduced service level"

Management Area Prescription 12C consists of minimally developed sites which would be managed at a "full service level".

Management Area Prescription 12D consists of highly developed sites which would be managed at a "full service level".

Management Area Prescription 12E consists of rifle ranges, observation sites, developed trails and trail shelters (other than those on the Appalachian National Scenic Trail)

Management Area Prescription 12F consists of developed recreation sites which would be managed under "custodial management" [*Management Area Prescription 12F* is only used in **Alternative 3**]

Management Area Prescription 13A contains areas that are unsuitable for timber production and are managed to provide for a dense concentration of recreation users with a high degree of motorized access

Management Area Prescription 13B consists of lands which are suitable for timber production where uneven-aged timber harvest cutting methods can be applied and are managed to provide for a dense concentration of recreation users with a high degree of motorized access

Management Area Prescription 13C consists of areas of the Forest which are managed to retain their "unroaded" condition.

Management Area Prescription 13D is applied to areas that are managed to provide for a dense concentration of recreation use in a manner that is complementary to the wilderness-corridor complexes [*Management Area Prescription 13D* is only used in **Alternative 3**]

Management Area Prescription 14A consists of areas of the Forest which are unsuitable for timber production where management practices such as prescribed burning and creating openings are used to provide wildlife habitat

Management Area Prescription 14B consists of areas of the Forest which are suitable for timber production where uneven-aged timber harvest methods with 10-year to 15-year entry cycles are used to provide continuous overstories of older and younger trees, large dens and continuing supplies of hard and soft mast

Management Area Prescription 14C consists of areas of the Forest which are suitable for timber production where even-aged timber harvest methods with longer rotations are used to provide mosaic groupings of older and younger trees, large dens, and continuing supplies of hard and soft mast

Management Area Prescription 14D consists of areas of the Forest which are suitable for timber production where either even-aged and uneven-aged timber harvest cutting methods are used to provide to provide mosaic groupings of older and younger trees, large dens, and continuing supplies of hard and soft mast [*Management Area Prescription 14D* is only used in **Alternative 7**]

Management Area Prescription 14E consists of areas of the Forest which are suitable for timber production, where black bear is the featured species, and where even-aged timber harvest cutting methods are used to provide wildlife habitat using standards contained in the existing Forest Plan [*Management Area Prescription 14E* is only used in **Alternative 2**]

Management Area Prescription 15A consists of areas of the Forest which are unsuitable for timber production where management practices such as prescribed burning and creating openings are used to provide wildlife habitat.

Management Area Prescription 15B consists of areas of the Forest which are suitable for timber production where uneven-aged timber harvest methods with 10-year to 15-year entry cycles are used to provide continuous overstories of older and younger trees and continuing supplies of hard and soft mast for species

Management Area Prescription 15C consists of areas of the Forest which are suitable for timber production where even-aged timber harvest methods with longer rotations are used to provide mosaics of older and younger trees and continuing supplies of hard and soft mast

Management Area Prescription 15D consists of areas of the Forest which are suitable for timber production where either uneven-aged and even-aged timber harvest cutting methods are used to provide wildlife habitat. [*Management Area Prescription 15D* is only used in **Alternative 7**]

Management Area Prescription 15E consists of areas of the Forest which are suitable for timber production, where wild turkey is the featured species, and where even-aged timber harvest cutting methods are used to provide wildlife habitat using standards contained in the existing Forest Plan. [*Management Area Prescription 15E* is only used in **Alternative 2**]

Management Area Prescription 16A consists of areas of the Forest which are suitable for timber production where even-aged timber harvest cutting methods are used to provide wildlife habitat.

Management Area Prescription 16B consists of areas of the Forest which are suitable for timber production where either uneven-aged and even-aged timber harvest cutting methods are used to provide wildlife habitat [*Management Area Prescription 16B* is only used in **Alternative 7.**]

Management Area Prescription 16C consists of those lands on the Forest suitable for timber production where white-tailed deer is the featured species. Standards in the existing Forest Plan are incorporated in this management area prescription Both even-aged and uneven-aged timber harvest cutting methods are used to provide wildlife habitat. [*Management Area Prescription 16C* is only used in **Alternative 2**]

Management Area Prescription 16D consists of areas of the Forest which are suitable for timber production where even-aged timber harvest cutting methods are used to benefit ruffed grouse.

Management Area Prescription 16E consists of areas of the Forest which are unsuitable for timber production which are interspersed with suitable acreages in Management Area 16

Management Area Prescription 17A consists of areas of the Forest which are 100 acres or larger, site index 70 or higher for oak or equivalent, accessible and gently sloping, suitable for intensive economical timber production, and are managed using uneven-aged timber management (single tree and group selection timber harvest cutting methods). *Management Area Prescription 17A* does not include riparian areas

Management Area Prescription 17B consists of lands tentatively suitable for timber production in any slope class with site index 70 or higher for oak or equivalent which are managed using even-aged timber management (clearcutting and shelterwood timber harvest cutting methods) *Management Area Prescription 17B* does not include riparian areas

Management Area Prescription 17C consists of lands tentatively suitable for timber production in any slope class with site index 70 or higher for oak or equivalent which are managed using even-aged timber management (clearcutting and shelterwood timber harvest cutting methods). *Management Area Prescription 17C* includes riparian areas within the management area [*Management Area Prescription 17C* is only used in **Alternative 5**]

Management Area Prescription 17D consists of areas on the Forest which are 100 acres or larger, accessible and gently sloping, and with a site index of 50 or 60 for oak or equivalent where a mixture of forest products are harvested, regenerated and grown on lands suitable for timber production using uneven-aged management practices *Management Area Prescription 17D* does not include riparian areas

Management Area Prescription 17E contains portions of the Forest of any slope class and site index 50 or 60 equivalent for oak where even-aged timber harvest cutting methods are used to provide a mixture of forest products which are harvested, regenerated and grown on lands suitable for timber production *Management Area Prescription 17E* does not include riparian areas

Management Area Prescription 17F contains portions of the Forest where even-aged timber harvest cutting methods are applied to provide high quality, valuable sawtimber which are viewed from moderately sensitive roads, trails or developed recreation areas and

which carry a visual quality objective of partial retention *Management Area Prescription 17F* includes riparian areas within the management area. [*Management Area Prescription 17F* is only used in **Alternative 8A.**]

Management Area Prescription 17G contains portions of the Forest which are unsuitable for timber production, are mapped as Management Area 17 and have a visual quality objective of retention. *Management Area Prescription 17G* includes riparian areas within the management area

Management Area Prescription 17H consists of areas of the Forest which are unsuitable for timber production which are interspersed with suitable acreages in *Management Area Prescriptions 17B or 17E* *Management Area Prescription 17H* does not include riparian areas.

Management Area Prescription 17I consists of areas of the Forest which are unsuitable for timber production which are interspersed with suitable acreages in *Management Area Prescription 17F.* *Management Area Prescription 17I* does not include riparian areas. [*Management Area Prescription 17I* is only used in **Alternative 8A.**]

Management Area Prescription 18A consists of those riparian areas in the Forest that are adjacent to Management Areas 1, 3, 4, 5, 6, 9, 12, 20, 21 and 22 and unsuitable portions of Management Areas 7, 10, 11, 13, 14, 15, 16, and 17 These riparian areas are managed to enhance this unique resource values. Management activities are designed to meet site specific deficient needs in the desired future conditions The lands within this management area prescription are classified unsuitable for timber production. [*Management Area Prescription 18B* is used in **Alternatives 4, 5, 8A, 10 and 12**]

Management Area Prescription 18B consists of those riparian areas in the Forest that are adjacent to the suitable portions of Management Areas 7, 10, 11, 13, 14, 15, 16, and 17 These riparian areas are managed toward the desired future conditions while allowing limited harvest of timber products [*Management Area Prescription 18B* is only used in **Alternative 8A**]

Management Area Prescription 18C consists of those riparian acres in the Forest that are adjacent to or for a distance of one mile upstream of the following municipal water supplies (Lynchburg Reservoir, Coles Run Reservoir, Mills Run Reservoir, Clifton Forge Reservoir, Skidmore Reservoir, Staunton Reservoir, and Elkhorn Lake). The lands within this management area prescription are classified unsuitable for timber production. [*Management Area Prescription 18C* is only used in **Alternative 8A**]

Management Area Prescription 18D consists of those riparian areas in the Forest that are adjacent to lands suitable for timber production. Riparian dependant resources are actively managed toward providing self-maintaining habitats that will maintain the desired future condition for riparian dependant resources [*Management Area Prescription 18D* is used in **Alternatives 10 and 12.**]

Management Area Prescription 19A consists of management direction incorporated in Amendment #4 to the Forest Plan and serves as current management direction All riparian areas are defined as being 100 feet on either side of perennial streams [*Management Area Prescription 19A* is only used in **Alternative 2.**]

Management Area Prescription 19B consists of a variation of interim management direction suggested by the Virginia Department of Game and Inland Fisheries and the West Virginia Division of Natural Resources. Riparian areas are defined as being at least 100 feet on either side of "native trout" streams and at least 50 feet on either side of all other perennial streams [*Management Area Prescription 19B* is only used in **Alternative 7**]

Management Area Prescription 19C consists of a variation on interim management direction suggested by a number of groups in comments to the DEIS Riparian areas are defined as being at least 100 feet on either side of "native trout" streams and at least 50 feet on either side of all other perennial streams [*Management Area Prescription 19C* is used in **Alternatives 6, 11 and 13**]

Management Area Prescription 19D contains riparian areas in the "general forest area" of the Forest which are maintained in a natural condition by excluding management practices All riparian areas are defined as being at least 200 feet on either side of perennial streams [*Management Area Prescription 19D* is only used in **Alternative 9**]

Management Area Prescription 20A is applied to the administrative sites on the Forest in **Alternatives 2, 4, 5, 6, 7, 8, 8A, 9, 10, 11, 12, 13** and **14**

Management Area Prescription 20B is applied to the utility corridors on the Forest in **Alternatives 2, 4, 5, 6, 7, 8, 8A, 9, 10, 11, 12, 13** and **14**

Management Area Prescription 20C is applied to the communication sites on the Forest in **Alternatives 2, 4, 5, 6, 7, 8, 8A, 9, 10, 11, 12, 13** and **14**

Management Area Prescription 20D is applied to the administrative sites on the Forest in **Alternative 3.**

Management Area Prescription 20E is applied to the utility corridors on the Forest in **Alternative 3**

Management Area Prescription 20F is applied to the communication sites on the Forest in **Alternative 3**

Management Area Prescription 21A is applied the Big Schloss Special Management Area.

Management Area Prescription 21B is applied to the Laurel Fork Special Management Area

Management Area Prescription 21C is applied to the Little Laurel Special Management Area

Management Area Prescription 21D is applied the Little River Special Management Area

[Management Area Prescriptions 21 are only used in **Alternative 8A**]

Management Area Prescription 22 contains portions of the Forest that are managed intensively for a variety of wildlife species with each area focusing on a theme such as wildlife viewing, nature study, small game management, or combinations thereof Associated with this theme is a high level of dispersed recreational use Easy access in many of these areas facilitates use by people with disabilities [Management Area 22 is only used in **Alternative 8A**]

1 Management Emphases

Table B-4 displays the management emphases included in the FORPLAN model as Level 7 identifiers and their link to the management prescriptions.

Table B-4.
Management Area Prescription Link to FORPLAN

Management Area Prescriptions	FORPLAN Code	Description
1A, 1B, 20A-F	00 MINLVL	Minimum Level Management
2A-B, 3A-B, 4A-E, 5A-D, 9A, 9C	1A PRSREN	Naturally occurring changes or very limited management
9B	1B PRSMVL	*Remote Areas managed as "Remote Highlands"*
6A-C	3A VIS	Appalachian Trail
7C-D	3M VISMVL	Visual Management with no timber harvest
13B	3U VISUAM	Visual Management with uneven-aged timber management. Includes Sensitive Viewsheds
7B, 7E-F	3E VISEAM	Visual Management with even-aged timber management. Includes Sensitive Viewsheds
7A	3F VISERM	Visual Management with retention foreground using even-aged timber management
8A-E	4A WLNESS	Existing or Potential Wilderness Area Management
10A	5A WSSUAM	Scenic Rivers with uneven-aged timber management and retention VQO
10B, 10D	5B WSREAM	Recreation Rivers with even-aged timber management and partial retention VQO
10C	5M WSSMVL	Recreation and Scenic Rivers with no timber management
11A, 11D, 11F	6M MOTMVL	Motorized recreation with no timber management
11B	6U MOTUAM	Motorized recreation with uneven-aged timber management
11C, 11E, 11G	6E MOTEAM	Motorized recreation with even-aged timber management
12A-F	7A DEVREC	Developed Recreation Sites
13A, 13D	7G DISREC	Dispersed Recreation Sites
13C	7M DISMVL	Dispersed Recreation managed to retain "unroaded conditions"
14A	8M RMTMVL	Wildlife needing mature forest or require remoteness managed at minimum level
14A	8A RMT	Wildlife needing mature forest or require remoteness with non-timber management practices
14B	8U RMTUAM	Wildlife needing mature forest or require remoteness with uneven-aged timber management

Management Area Prescriptions	FORPLAN Code	Description
14C, 14D, 14E*	8E RMTEAM	Wildlife needing mature forest or require remoteness with either uneven-aged or even-aged imber management
15A	9M TKYMVL	Wildlife needing small clearings managed at minimum level
15A	9A TKY	Wildlife needing small clearings with non-timber management practices
15B	9U TKYUAM	Wildlife needing small clearings with uneven-aged timber management
15C, 15D 15E*	9E TKYEAM	Wildlife needing small clearings with either uneven-aged or even-aged timber management
16A-E	10 BWSTIM	Wildlife needing early successional stages with even-aged or uneven-aged timber management
17A, 17D	1U TIMUAM	Intensive uneven-aged timber management
17B, 17C, 17E	1E TIMEAM	Intensive even-aged timber management
17G-I	1M TIMMVL	Intensive timber management managed at minimum level
18A-C, 19A-D	RA RIP	Riparian Area Management with no timber management
21	1C SMAMVL	Special Management Areas. Big Schloss, Laurel Fork, Little River, and Mount Pleasant
22	7N WLDMVL	Wildlife species with viewing, nature study, and small game management

Note· Management prescription 18D is not shown in the above table The small acreages by alternative in management prescription 18D were modeled using the typically uneven-age or even-age timber management practices

In alternatives that did not allow timber management within the riparian area, the acres of riparian area were subtracted from the timber prescriptions and allocated to the FORPLAN emphasis RIP

2 Management Intensities

A wide range of silvicultural options was developed after consideration of biological, technical, and economic factors. Entering into this development were the timing choices (rotation ages) available for harvesting timber As required by NFMA, harvesting was not permitted to begin until culmination of mean annual increment had been reached.

The range of rotation ages changed by management emphases to address the interaction with wildlife habitat requirements. Generally, long rotation ages were used in recreation and wildlife prescriptions while shorter rotation ages were used for the intensive timber prescriptions Table B-5 shows the timber options included in the FORPLAN model as Level 8 identifiers

* For prescriptions 14E and 15E in alternative 2, the wildlife score ratings were lowered and dispersion constraints were raised to reflect current management direction

Table B-5.
Timber Intensities Analyzed in FORPLAN

Timber Mgmt System	FORPLAN Code	Description
Even-aged	CA CN	Clearcut, Natural Regeneration
	CB CSN	Clearcut, Site Prep, Natural Regeneration
	CC CSNR	Clearcut, Site Prep, Natural Regeneration, Release
	CD CSPRT	Clearcut, Site Prep, Plant, Release, One Commercial Thin
	CE CSNRT	Clearcut, Site Prep, Natural Regeneration, Release, One Commercial Thin
	CF CCVT	Clearcut, Convert Hardwood To Pine Including Site Prep, Plant, Release, One Commercial Thin
Even-aged	SA SN	Shelterwood, Natural Regeneration
	SB SSN	Shelterwood, Site Prep, Natural Regeneration
	SC SSNR	Shelterwood, Site Prep, Natural Regeneration, Release
	SD SSNRT	Shelterwood, Site Prep, Natural Regeneration, Release, One Commercial Thin (White Pine Only)
Even-aged	MA MSN	Modified Shelterwood, Natural Regeneration
	MB MSSN	Modified Shelterwood, Site Prep, Natural Regeneration
Uneven-aged	GA GN	Group Selection, Natural Regeneration
	IA IN	Individual Tree Selection, Natural Regeneration

Notes: The seed tree option is also available, but since the timber yields are very similar to clearcutting, they were not modeled separately.

The shelterwood pattern was modeled in FORPLAN by having 60% of the volume harvested for the regeneration cut, and the remaining 40% harvested the following decade.

The modified shelterwood pattern was modeled in FORPLAN by having 75% of the volume harvested for the regeneration cut. The remaining overstory was left for other resource purposes and was not scheduled for removal.

Timing choices for even-age management varied by working group and management emphasis. Given the existing age, working groups were given the latitude of harvesting up to 100 years (10 decades) from that age. The existing age varied by the condition class (Level 6 identifier) Seed/saplings stands were not allowed the option to harvest until culmination of mean annual increment was reached Regenerated land was given a narrow range to keep the complexity of the model to a minimum Uneven-age management was permitted to start in any decade analyzed, but once it started, harvesting then continued each decade. Table B-6 shows the regenerated timing options, otherwise known as rotation ages, analyzed in FORPLAN.

Table B-6
Rotation Ages by Emphases by Working Group

Condition	Management Emphasis	Working Group Ages UP	CV	WP	YV
	VISEAM, WSREAM RMTEAM	130	130	80	80
	TKYEAM	120	120	70	70
	MOTEAM, BWSTIM TIMEAM	90	90	60	60

Two non-timber intensities were also developed that affect vegetation The vegetation non-timber options represent activities that historically have occurred on the Forest. Table B-7 shows the non-timber options included in the FORPLAN model as Level 8 identifiers

Table B-7.
Non-Timber Intensities Analyzed in FORPLAN

Type of Option	FORPLAN Code	Description
Minimum Level	ML MINLVL	Minimum Level Management
Vegetation Treatment	PB PBURN	Prescribed Burning
	WC WLFCL	Construct Wildlife Clearings

3. Yield Coefficients

Resource production or yield coefficients are necessary to determine the ability of the land to produce and to predict output levels associated with different management activities For use in FORPLAN, per-acre yield or capacity coefficients were developed for wildlife, timber, and developed, dispersed, and wilderness recreation These were developed to coincide with and respond to changes in the analysis area

Major production coefficients used in FORPLAN were expressed in the following units·

Thousand Cubic Feet (MCF)	Miles of Road
Tons of Sediment	Wildlife User Day (WFUD)
Number of Animals	Recreation Visitor Days (RVD's)

The resource yield tables in FORPLAN contain the per-acre yield coefficients for the scheduled outputs. These tables were accessed by management prescriptions as they were allocated by analysis area As the land allocation and schedule changes between alternatives, a particular yield will also change

Although yield coefficients were developed for interactions or tradeoffs among the timber, transportation, recreation, wildlife and soil resources, only timber, dispersed recreation, roads, and wildlife outputs were key to analysis inside FORPLAN All other resources were analyzed external to the model

a Recreation — Per-acre recreation capacity coefficients were developed The capacity coefficients presented in Table 8, page IV-23, of the 1986 ROS book were used as a starting point for developing coefficients specific to the Forest. Capacity estimates did not include hunting and fishing use Hunting was calculated as part of the wildlife yields Fishing capacity was analyzed outside the model

A three-step process was used to develop the final coefficients First, the theoretical capacity coefficients for SPNM, SPM, and RN ROS classes were adjusted to reflect the Forest's practical capacity based on three factors social setting, vegetation, and land type The SPM coefficients were subdivided to reflect the different capacities in the forest's two SPM subclasses (refer to Appendix G of this EIS).

Next, this resultant base was converted from PAOT/acre measurements to RVD/acre/year measurements Here, length of the managed season was entered into the calculations to add the dimension of time to the values. These base values were used in FORPLAN and applied to those management prescriptions and ROS classes that do not include riparian areas and/or that do not involve timber management practices. Distinct values for riparian areas and timber management prescriptions were developed last

In the last or third step, forestwide yields were adjusted further to reflect site-specific differences associated with individual prescriptions For example, it was assumed that riparian areas located in roaded areas have a lower capacity than roaded areas on a rocky ridgetop This is due to the sensitive soils and vegetation that exists in a riparian area. Likewise, the capacity values were customized to reflect the influence of timber management from a visual quality perspective Many people do not like the immediate effects of certain timber management activities, however, over time, as trees mature, this initial reaction changes. These values associated with prescriptions that allow for timber harvest reflect an age-dependent relationship showing a reduction in recreation capacity immediately after a harvest occurs Full capacity then gradually returns as the stand matures

For further information, a paper titled *Recreation Capacity Coefficients, Wilderness and Nonwilderness Dispersed Recreation* dated March 26, 1991, is available for review in the planning records.

b Timber — Yield tables were developed that represent the mixed species stand characteristic unique to the Forest Available published yield tables were adapted to represent known mixtures of species Schnur (1937) provided starting point yields for Upland Oak, while Schlaegel (1969) was used for Yellow poplar, the dominant species in the Cove Hardwood working group For yellow pine group, USDA (1929) information on shortleaf pine was used White pine starting point information came from Doolittle (1956) and Gevorkiantz (1956)

A four-step process was used First, published yield information was gathered for each species in the working group Second, using summarized harvested timber sale data from 1968 to 1985, the percent species composition for each working group was determined Next, base yield tables for each working group by age class and site index (Productivity Level) were developed using the published information adjusted by the percent species composition from the second step.

Lastly, from experienced volume data from 1985 to 1988, base yield table volumes were adjusted downward to arrive at yield tables representing the existing conditions on-the-ground. One adjustment factor, based on the typical existing stand age and site index was applied across all ages and site indexes and differed by working group This provided a basis for differentiating between existing on-the-ground conditions and expected regenerated conditions once the stand was brought under management Typically, the base yield tables were used once the stands were cut and regenerating

After completion, the results were cross checked with empirical yield information from the 1985 Forest Survey data for the Northern Mountain Unit of Virginia and with experienced yields from individual Forest sale data Numbers developed were all consistent with this published information

For further information, a paper titled *Timber Yields for Forest Land Management Planning* dated February 19, 1991, is available for review in the planning records

c. Wildlife — Habitats for three management indicator species were modeled in FORPLAN. These three species (deer, bear, and turkey) were chosen not only because they represent hunting, but because their habitat requirements represented the range from early successional needs to late or climax successional needs.

First, basic habitat capability curves were developed by a group of biologists representing Forest Service, Virginia Polytechnic Institute (VPI), Virginia Department of Game and Inland Fisheries (VDGIF) and the West Virginia Department of Natural Resources (DNR) The effort was directed at producing relative density measurements of the habitat values of different age class stands for various forest habitat types for a given wildlife species Considered in this endeavor were the optimal or maximum carrying capacities for each species

For the basic curves, then, an estimated population number by decade by working group by wildlife species was developed

Next, the basic curves were adjusted to show the environmental effects on habitats and thus populations, of implementing the various management prescriptions (Emphasis and intensities as defined in Level 7 and 8 analysis area identifiers). Each prescription affected each wildlife species differently

Biologists from the VDGIF and DNR adjusted the basic curves to show the habitat capability of each species for each management prescription modeled in FORPLAN

Adjustment to the basic curves was based upon a consistent rating system developed by VDGIF which considered the amount of open road density, frequency of entry, quiet periods, size of openings, and the percent suitable in the 0-10 year old age class within each prescription Each of these criteria were related to issues surrounding wildlife management (refer to Issues 1 and 8 in Appendix A to this EIS) This rating system ranked the environmental effects of these criteria in order of importance and also assigned a numerical score to the different degrees of impacts within each effect

The resultant score was used, in most cases, to reduce each species basic habitat curve, thus showing the effect of implementing the management prescription with its associated standards

Documenting this process are two papers· *Estimates of Wildlife Yields for Land and Resource Management Planning* dated May 30, 1989 and *Evaluating Habitat Capabilities for Deer, Bear, and Turkey in Regards to Forest Land Management Plan Prescriptions*, dated January 30, 1991 Both are available for review in the planning records

d Soil — Sediment predictions were developed for earth disturbing activities modeled in FORPLAN conventional and cable logging, system road construction, and prescribed burning Predicted sediment yields are *in addition to* background sediment caused by nature, since the source, channel erosion, is a constant unaffected by management activities In other words, all yields associated with the different activities represent accelerated sedimentation above that occurring in a natural state.

The proportions of temporary roads, skid trails, and landings were considered in developing the yields Recovery rates were based on published research Rates applied to roads constructed and left open for motorized use do not return to pre-construction levels.

The basis for development of the sediment yields was the Region 8 *Procedure for Preparing Soil Loss, Sediment Yield, and Water Yield Estimates for Forest Plans* dated 1981. Soil loss rates were developed using the Universal Soil Loss Equation and coefficients from *Predicted Erosion Rates for Forest Management Activities in the Southeast* (Dissmeyer and Stump, 1978) To obtain sediment yields, soil loss rates were multiplied by a sediment delivery ratio derived from Roehl (1962), which relates sediment delivery to drainage basin size

Final yields were adjusted by management emphases to reflect an assumed amount of open versus closed roads in each of the emphases.

For further information, a paper titled *Predictions for Sediment Yield for Land Management Planning* dated October 5, 1990, is available for review in the planning records

e Transportation — The basis for all yield development were the results from transportation planning on 27 areas (TAU's) completed between Fiscal years 1987 and 1988 Based on that sampling (30 percent of the Forest), a road density was determined which represented that amount of road needed, on average, to harvest timber

Road yields in the model only include Forest Service System roads and not roads under other jurisdictions such as State or County roads

First, road density was determined for existing roads, existing roads needing reconstruction, and planned new roads This was done by grouped ROS classes of SPNM and SPM/RN combined. Then the needed road network was subtracted from the existing road network to calculate needed new construction by the two ROS breakdowns. Based on sampling, it was determined reconstruction miles were assumed to be a certain percentage of new construction.

Road needs done as part of the TAU process deal only with those required to support the timber program As such, this analysis dealt with accessing tentatively suitable timberland. Since the ROS acres dealt with the total land base and the TAU's dealt with just tentatively suitable land, the density calculations were adjusted so they would be comparable.

For further information, a paper titled "*ESTIMATES OF ROAD YIELDS FOR FOREST LAND MANAGEMENT PLANNING*" dated March 12, 1991, is available for review in the planning records.

4 Cost Estimates

All costs that might affect the allocation of the resources were handled in the FORPLAN model. This included the cost of developed recreation, dispersed recreation, wilderness, wildlife, roads, and timber.

All Forest Service costs were included for purposes of estimating budgets and calculating present net values for each alternative

The cost data were developed by gathering the various costs of the Forest management activities from the Forest National Information Requirements Projects (NIRP) codes Generally, a three-year average of the 1988 to 1990 data was used. Each cost was categorized as either a fixed or variable cost Variable costs change with different levels of vegetation management All costs were adjusted to 1989 dollars

Variable costs were tied to the implementation of activities within a FORPLAN prescription, and were expressed as costs per acre or cost per unit of output (dollars per mile, dollars per MCF)

Variable costs also included those necessary to meet legal requirements to insure public safety and environmental protection (such *as protection for threatened and endangered flora and fauna). These costs were incorporated into all the management prescriptions* and calculated in FORPLAN

Fixed costs were the same for all management prescriptions of the same emphasis and intensity. These costs were included in the FORPLAN solution depending on the mix of prescriptions that were chosen These costs contribute to the FORPLAN objective function of maximizing present net value. These costs included general administration, long range planning and inventory, and facilities capital investment, maintenance and replacement The fixed costs were assumed to be constant over the range of resource production *outputs and alternatives which were considered in the Revision.*

Table B-8 displays the variable costs that were analyzed in FORPLAN Included in this table is the range of costs that varied by prescription See section 3 4 of the FORPLAN data set for more information

Table B-8.
Activities Modeled as Variable Costs

FORPLAN NIRP Code	Activity Description	Unit of Measure	Range of Costs in Model
A12A	Dispersed Rec Administration	MRVD	$26 50
CW22	Wildlife Non Structural Improve	Acre	$64 05 - $281 00
E112	Timber Harvest Administration	MCF	$21.14
E114	Timber Sale Preparation	MCF	$70 15 - $217 50
E13A	Cultural Res. Coordination	Acre	$13 67
E13B	Visual Res. Coordination	Acre	$ 4 56
E13C	Wildlife Res Coordination	Acre	$14 34
E13D	Fish Res. Coordination	Acre	$ 9 56
E13E	Soil & Water Res Coordination	Acre	$14.40
E241	Site Preparation	Acre	$74 00 - $85.00
E243	Planting	Acre	$100 00-$115.00
E251	TSI - Release	Acre	$110 00-$126 50
L22L	Road Construction	Mile	$10,009-$14,608
L23L	Road Reconstruction	Mile	$4,469 - $6,310
L41L	Preconstruction Construction	Mile	$5,000
L42L	Preconstruction Reconstruction	Mile	$5,000
L221	Road Contract Administration	Mile	$2,500
LT23	Road Maintenance	Mile	$ 400

Trends in real cost increases were assumed constant over the analysis period Thus, real cost increases were not built into the model. The Forest assumed real price trends for all resources were the same The economic efficiency analysis, therefore, uses the relative values of different resources which the Forest now knows, versus using predicted future relative values which usually defy prediction with any high degree of accuracy.

In their appeal to the original Forest Plan, NRDC alleged that timber values were grossly exaggerated They stated that permitting timber values, but not other values to increase over time, skewed the economic analysis in favor of timber production. Because of this point, the Forest did not permit any resource to change prices over time, thus treating all resources the same.

5 Values of Benefits

Most resource outputs (benefits) had a monetary value (price) placed on them for the revision analysis "Priced benefits" as they are called, were further subdivided into two areas. those outputs based upon the price a consumer is willing to pay if he/she had to, but right now doesn't (non-market outputs), and those outputs based upon the price a consumer actually pays right now, for example, in a grocery store (market outputs)

PNV was calculated entirely by using FORPLAN All relevant benefits were calculated inside the model, such as those that may vary/or change with alternatives For some resources, however, information was "hardwired" into FORPLAN, being placed inside the model just to account for the total PNV There was no need to analyze these resources in such detail since there were no significant public issues related to them. This also helped to cut down on the size of the model The resource uses modeled this way were mineral leasing and fishing

All values represented similar points in the manufacturing/production process Timber was valued on the stump, and wildlife/ recreation user days on the ground where they are used

Table B-9 shows the benefit values, in 1989 dollars, included in FORPLAN.

Table B-9.
FORPLAN Benefit Values

Resource Use	Unit of Measure	Source of Value	Last Quarter 1989 Dollars
Developed Recreation	RVD'S	1990 Final EIS for RPA (page B-18)	$17 74
Dispersed Recreation Use (Nonwilderness)	RVD'S	1990 Final EIS for RPA (page B-18)	See individual values below
—By Recreation Opportunity Spectrum Classes			
Semi-Primitive Non-Motorized			$10 89
Semi-Primitive Motorized			$15 64
Roaded Natural			$12 78
Wilderness Use Standard	RVD'S	1990 Final EIS for RPA (page B-19)	$20 01
Wildlife and Fish Use	WFUD'S	1990 Final EIS for RPA (page B-22)	See individual values below
—Big Game Use			$33 27
—Resident Fish Use			$65 56
Mineral Leases (Oil & Gas)	ACRE	1990 Final EIS for RPA (page B-16)	$1 00
Timber Production	MCF	High Bid of Volumes Sold between 1987 - 1991	See individual values below
—Pulpwood	MCF		
Upland Hardwoods			$63.00
Cove Hardwoods			$64 00
White Pine			$54 00
Virginia/Yellow Pine			$50 00
—Commercial Fuelwood	MCF		$97 00
—Sawtimber	MCF		
Upland Hardwoods			$530 00
Cove Hardwoods			$466 00
White Pine			$409 00
Virginia/Yellow Pine			$313 00

Timber Prices

Historical records of past value received for Forest timber is the best estimator of future value Historical sale data by species was readily available Values received on private or industry land are not relative to conditions on NF land.

National forest timber values are derived from the appraised value of the sale as a whole, and are increased by the bidding process if there is competition If there is no competition, sales are bid at or near the appraised value The sale is appraised as a whole, and therefore the bid value and price received is based on conditions related to the sale as a whole, and not average DBH, logs per thousand or other factors

Timber sales often consist of a variety of site conditions including steep and not steep land, timber in various working groups, numerous species and variable combinations of species, different site indexes among stands, and different sizes and ages of timber This further complicates any analysis at less than sale as a whole. The appraised value and bid value represent an amalgamation of all variables This fact led to the relatively logical conclusion that, if using available historical sale records, the only measurable variables corresponding to value were species and product

Prices were developed from known stumpage values of certain species The critical factors then, in determining different timber values in FORPLAN, were the relative amount of species and products among the stands comprising the analysis areas These factors were easily determined from historical volume cruise data which is available on an individual stand basis The product mix (sawtimber/ roundwood) is dependent on each stand's characteristics, such as site index, age, and condition class The price of each product is dependent on sale as a whole (includes many stands) characteristics Purchasers determine the overall value of the sale as a whole and bid on individual species or groups of species by product class such as sawtimber, pulpwood, or fuelwood

The product mix varied between working groups and by site index within the Working Group. Average bid prices were determined from 5 years of sold records for the four species groups comprising the four working groups The species prices were then prorated by the percentage of volume that the species groups comprise in each working group Table B-10 shows percent species composition by working group.

Table B-10
Percent Species Composition by Working Groups

Working Group	Upland Oak	Yellow Poplar	Yellow Pine	White Pine
Upland Oak	82 1	1 9	9.9	6 1
Cove Hardwood	48 2	39 6	1 8	10 4
White Pine	32 1	13.1	4 6	50 2
Yellow Pine	32 5	0	60 8	6 7
Virginia Pine	21 5	0	78 5*	0

*This component is all Virginia Pine In other working groups the Virginia Pine volume percentage is negligible

The average bid value for each working group was then converted to cubic feet by applying a board foot to cubic foot conversion factor This ratio ranges between 5 90 and 6.24 and varies by working group

The last part of determining timber prices was determining the mix of products for each working group. Table B-11 displays the product distribution among the working groups

Table B-11.
Summary of Product Distribution

Working Group	% Sawtimber	% Pulpwood	% Fuelwood
Upland Hardwood			
Site 40	5	70	25
Site 50	13	74	13
Site 60	22	66	12
Site 70	33	57	10
Cove Hardwood	40	52	8
White Pine	41	59	--
Yellow Pine	19	81	--

For more information on the development of timber prices, a document entitled *Timber Price Model*, dated June 3, 1991, is available for review in the planning records

Other Benefits

The 1990 RPA report places a value on water in Region 8 of $34/acre-foot for irrigation use and $54/acre-foot for municipal use There is some question as to whether increased water yields should actually be valued for Forest or project planning on the Forest Water was not valued in FORPLAN

Clean water is an important issue to all Americans The Forest actually produces more water, from a quantity perspective, than is demanded By not placing a dollar value on water in the FORPLAN model, the Forest is not implying that water has no value However, since the "background level" of water (that level which naturally flows from the Forest regardless of how the Forest is managed) exceeds the amount being demanded, there is no value on producing additional volume that will not be used This background value is the same for all alternatives, and placing a value on the amount used would only serve to artificially inflate the present net value of the objective function by a constant amount for all alternatives It would not change the relative importance of water between alternatives

A document titled *Valuing Water*, dated September 22, 1991, is available for review in the planning records

Priced and Non-Priced Benefits

Both priced and non-priced benefits were incorporated in the economic efficiency analysis for each alternative. Resource outputs to which dollar values were assigned constitute the "priced benefits" included in the PNV calculations (refer to Table B-9 above)

The economic efficiency analysis for each alternative also considered non-priced benefits. These benefits can be thought of as subjective qualitative values for each alternative and were often reflected in the model as "constraints" The addition of non-priced benefits to PNV is used to derive the Net Public Benefits (NPB) of each alternative This concept can become confusing because, as constraints are added, the PNV calculations are lowered

In some alternatives, the importance of these non-priced benefits is thought to outweigh the advantages of producing higher levels of priced outputs The net subjective values of the non-priced outputs must be considered to arrive at the overall NPB of an alternative.

Some of the most important non-priced benefits addressed during the Revision process revolve around the issues stated in Table B-12 For a discussion of non-priced benefits by alternative, see the Formulation of Alternatives section

Table B-12
Non-Priced Benefits Reflected as Constraints in FORPLAN

Issue	Constraint
Remote Recreation Experience (Issue 5 Sub-issue 4)	Acres harvested in SPNM areas
Timber Harvest Level (Issue 2, Sub-issue 9)	Volume of timber harvested
Clearcutting (Issue 8 Sub-issue 2.)	Acres or volume harvested by clearcutting
Alternate Timber Harvest Method (Issue 2 Sub-issue 9)	Acres or volume harvested by methods other than clearcut
Riparian Areas, Wetlands and Bogs (Issue 1 Sub-issue 6)	Allowance or prohibition of harvesting within riparian areas
Compliance with USDA Policy on Below-Cost Timber Sale Programs (Issue 2 Sub-issue 4)	Acres treated by Prescribed Burning Acres of Wildlife Clearings Developed

Determination of Demand Estimates

Society's preferences for different resources is useful information to guide management direction, and allocation of land, manpower and money on the Forest This involves an estimate of anticipated future use for particular Forest resources. The public has concerns that the original analysis of timber demand was inadequate, and on whether demand was increasing for hiking and backpacking that would warrant the need for more areas for primitive camping and hiking

Demand estimates were developed for wildlife- and fish-related recreation, dispersed recreation, developed recreation, and timber

Timber Demand/Supply

Forest inventory and analysis (FIA) data and Commonwealth of Virginia forest products tax information (1969-1988) on wood processed by county mills, were analyzed to determine the local supply and demand situation The latter data source was assumed to be a good proxy for stumpage removed from each county and represented the supply of timber offered to the local market FIA data gave an idea of the distribution of ownership and growth, removal, and productivity of the timberland resource

The study area was defined as all counties with Forest lands plus some adjacent counties Adjacent counties (up to 50 miles distance from sawmills and pulpmills receiving the bulk of Forest stumpage) were included to recognize the assumption that mills that demanded Forest timber generally draw from an area within a 50-mile radius of the processing facility Thus, Forest timber supply would compete with other landownership categories within this 50-mile radius.

Timber Supply

Historical changes in the net volume of growing stock is one indicator of timber resource sustainability into the future. Information for the Virginia sub-area shows an overall increase in growing stock from 4450 4 to 5294 4 MMCF over the 9-year period from 1978 thru 1986 This is a 19% increase which reflects an average annual net growth rate of approximately 2% per year This positive growth rate is generally consistent across all softwood and hardwood species groups, except for shortleaf pine, which declined 60%

Timber removals in the market area counties were approximated by Virginia forest products tax data for wood processed by mills in the market area Over time, the general trend in removals has been an increase in pine sawtimber, a decrease in pine pulpwood, an increase in hardwood sawtimber, and fairly stable hardwood pulpwood removals, except for during the energy crisis and a related increase in fuelwood demand in the early 1980's.

Timber removals in the GW market area were compared with timber removals for the Forest The Forest timber harvest has increased at a faster rate over the last 12 years than the timber harvest in the market area Removal volume in the market area has increased by 1% per year, versus 6.3% in the Forest The most rapid increases on the Forest have occurred in the pine sawtimber and pulpwood markets Both hardwood sectors, however, still have the greatest absolute volume harvested

Sawtimber's percentage of the Forest's timber mix (27%) remained unchanged from 1977 to 1989 Pulpwood is still the main product coming off the Forest, even though the Forest market area's mix has changed from about 60% pulpwood in 1977 to 46% in 1988

The proportion of the total market as represented by Forest timber has grown from about 5% in 1977 to about 8 5% in 1987 Thus, the Forest has continued to increase its market share of the pine sawtimber and hardwood sawtimber and pulpwood markets It still has less than 10% of the total market, and these figures support the view that the Forest is a relatively small supplier of the total market demand.

Timber Demand

Timber demand can be addressed at several different levels — National, Regional or local. The 1989 RPA assessment provides an indepth analysis of National and Regional demand and is a reference source utilized in this study Local demand is assessed by examining mill capacity data for sawmills and pulp and paper mills in the market area

In previous Forest-level timber demand studies we sometimes referred to NFS timber demand which implies a subset of a local market This reference is inappropriate in that demand is for stumpage in a specified market, as defined in this study, and not for any particular land ownership group within the market area

The NFS, other public lands, forest industry and non-industrial private landowners are all sources of timber supply, and historically, these ownership classes have participated in the local market. The stumpage is not differentiated by ownership class The market does *not demand stumpage from any particular ownership, but equates total market demand with quantity supplied from all sources at a* specified stumpage price A mill located within or near NF boundaries may currently receive a high percentage of it's wood fiber from the NF, but could seek out an alternate source of supply somewhere in the area if necessary

Increases in demand for sawtimber have been somewhat volatile. For pulpwood, the increases have been rather steady, although at a slower annual rate than for sawtimber The product mix has changed over the last 20 years, very significantly, because sawtimber demand has greatly increased in this area. With growth exceeding removals by a factor of three, we expect no problems to arise in the ability of this market area (which encompasses the Forest timberlands) to satisfy mill demand in the foreseeable future Over the long term, however, sufficient regeneration of harvested lands would be needed to assure a continual adequate supply.

A change in Forest Service timber harvests could be offset by a change in the amount harvested by the non-industrial private *landowner A significant reduction in volume offered by the Forest Service should not have an adverse effect (for a mill in the form* of higher prices) because its portion of the supply mix is relatively small This is not to say that any individual operator, or a small operation that is currently utilizing NF timber, would not be inconvenienced, but that market volume would remain steady and the individual should be able to find other sources of timber

In an effort to take a closer look at what the potential effects of a change in timber volume from the GWNF would have on the local loggers, sawmills, furniture makers and pulpmills, an analysis of this was documented in the process paper entitled, *An Analysis of the Potential Geographic Impacts of Volume Changes in Timber Harvest on the George Washington National Forest Market Area* Some of the conclusions reached in this paper were that.

1 The likelihood of logging firms and other businesses that traditionally purchase a moderate to large percentage of their volume from the Forest being able to move their operations to other commercial forest lands depends on the magnitude and location of any changes in timber offered on the Forest Logging firms within Alleghany County appear to have the lowest likelihood of substituting stumpage from the Forest with stumpage from other lands Logging firms in Amherst, Augusta, Bath, Highland, Pendleton and Rockbridge Counties have a somewhat higher likelihood of substitution Substitution is much more likely for logging firms in Bedford, Botetourt, Frederick, Grant, Hampshire, Hardy, Mineral, Page, Rockingham, Shenandoah and Warren Counties

2. Generally, sawtimber off the Forest comprises less than 10% of the total sawtimber volume harvested off the Virginia counties in the Socio-Economic Impact Area It appears that the highest likelihood of a potential shortage of sawtimber volume would be from sawmills that are reliant on sawtimber volume from the Dry River or Warm Springs Ranger Districts. The lowest likelihood would be for the Pedlar and Lee Ranger Districts. Sawmills and furniture manufacturers located in Alleghany, Augusta, Bath, Highland and Rockingham Counties would be the most likely firms to be adversely affected by any reduction in the annual amount of sawtimber volume offered. It is important to note that almost 60% of the sawtimber volume harvested in the Virginia counties in the Socio-Economic Impact Area comes from those counties that contain the Pedlar Ranger District. The Pedlar Ranger District historically only offers 4% of that volume

Stumpage prices would rise somewhat if timber availability were restricted and the non-industrial private landowner preferred non-timber uses for his land. Increased prices may result if NIPF owners rethink the availability of their timber. Because NIPF landowners comprise 67% of the available timberland in the Forest market area and the GWNF currently supplies only 8 5% of the market demand, a substitution of NIPF volume for a FS reduction in harvest should be relatively easy.

A review of the supply capabilities from all ownerships in the Forest market area suggests that timber inventories are abundant and continue to grow The hardwood resource is under-utilized and increased inventories are expected over the next decade Softwoods are close to being utilized on a sustainable basis, and inventory changes depend upon the future rate of removals Individual species were not analyzed in great detail, but indications are that some changes in harvest rates of species within major species groups will be necessary Given these adjustments, no serious depletion of the timber inventory is foreseen in the shortrun The only adjustment in historic trends that is apparent in the data analyzed is in the harvest rate of pines and soft hardwoods from forest industry lands Given the total timberland resource base, this adjustment should be made without any critical resource shortages over the next 10-15 years

The "Analysis of Potential Geographic Impacts" paper described above also made the conclusion that based on discussions with representatives of the timber industry and recent and historic price trends for forest products, there does appear to be sufficient available supply of hardwood and pine pulpwood in the market area of the Forest to meet the needs of the four local pulpmills These mills can draw from a variety of sources where they can obtain pulpwood and chips at different prices Raw material from the Forest does not appear to be a major factor (less than 5%) of the total raw material processed by these mills The raw material from the Forest can be substituted by raw material from other sources, albeit at a higher marginal cost Due to the large percentage of national forest

lands in Alleghany, Augusta and Bath Counties, large reductions in raw material from these counties might require higher marginal costs to replace this material, particularly if reduction in material from the Forest were accompanied by similar reductions on the Jefferson and Monongahela National Forests

Timber supply conditions in the market area do not appear to support the need for an increased timber supply role for the Forest over the next 10-15 years In fact, the Forest's role could be decreased during this period, especially in the hardwood and "other softwood" species groups The growth-removal ratios for pine suggest less flexibility in this regard.

Timber demand continues to grow, even though the rate of growth has been erratic in the sawtimber market Sawtimber volume currently has the majority of the product mix volume in the market area increasing from 28% in 1968 to 54% in 1988 The Forest has increased its supply of pine and hardwood sawtimber, but the proportion of total volume that is sawtimber has been stable at 27% over the 20 year period from 1986-88

Three different approaches to estimating future supply/demand for timber and the role of the Forest in the market area were analyzed. These different approaches were based upon projections of historic supply trends, adopting the 1990 RPA Supply/demand equilibrium quantity change indexes; and projecting local market demand based on the historic trend in processing capacity in the market area These approaches were reviewed and the recommended projection of future timber volume for use by the Forest in the Revison has been presented in Chapter 3 of this EIS For further information, a paper titled *Timber Supply and Demand Analysis for the George Washington National Forest*, dated February 26, 1991, is available for review in the planning records

The 1990 RPA Assessment includes a comprehensive review of future economic and social structural changes and how they will affect the National and Regional timber markets The trends in this publication suggest future growth in timber demand but at a slower rate than has occurred or been expected in the past. It was determined that adopting the projected indexes of supply/demand from this source would provide the best estimate of future volumes needed for the Forest to maintain its current market share in the future. Estimates of future volumes were developed using the normalized base year information and the RPA Indexes These estimates are presented in Chapter 3 of this EIS Table B-13 presents the 1990 RPA Indices used to derive these demand estimates.

Table B-13.
1990 RPA Indices

Future Decade	Hardwood	Softwood
2000	116	114
2010	138	121
2020	148	131
2030	152	140
2040	152	147

Dispersed Recreation Demand

The Forest's objective was to determine demand for each of the dispersed Recreation Opportunity Spectrum (ROS) classes, namely: Primitive and Semi-Primitive Non-Motorized combined, Semi-Primitive Motorized, and Roaded Natural, Rural and Urban combined.

Demand estimates are presented only for those human activities which historically have been measured. Future demand estimates were developed through professional judgment supported by quantitative analysis of current and historic use. Future demand was estimated for the next fifty years The estimates were for the midpoint (1995 and 2035) of the decades.

The Forest provides both motorized and non-motorized recreational opportunities Sometimes conflicts occur between different recreation users of the Forest These conflicts are addressed in Chapter 3 of this EIS

Some publics said that sufficient area should be reserved from cutting trees and motorized-vehicle use to allow future opportunities to designate wilderness and permit primitive camping and hiking. They want the Forest Service to protect these "primitive and semi-primitive" areas so they will remain in a nearly natural state for the enjoyment of future generations In their words, local Forest Service officials "failed to recognize the public's vision in a plan that manages the forest for those special values that its surrounding private lands cannot produce. remote habitat for wildlife, primitive and semi-primitive recreation, and natural beauty." This, in turn,

raises the question of whether demand is increasing for these types of areas that would warrant more areas or an expansion of existing areas

This review of recreation demand for the Forest helped provide a basis for responding to the recreation issues raised by the public

Identification of Recreation Activities. Recreation use is a service that consists of a wide array of activities, ranging from camping at Sherando Lake to taking pictures of Forest scenes, or from walking a developed site trail to hiking in a wilderness The basic data that has been used to record use by activity is the Recreation Information Management system (RIM) The RIM inventory tracks *approximately 50 different activities These data are considered to be the most comprehensive and representative source of past and* current recreation use on the Forest.

RIM data were available by activities from 1967 to present. However, only from 1984 to 1986 was RIM data reported by activity by ROS Class The following activities are typical on the Forest The units are measured in Recreation Visitor days(RVD's)

- Day Use
- Hiking
- Camping
- Hunting
- Fishing
- Motorized Travel
- Viewing Scenery
- Horseback Riding
- Gathering Forest Products

From a national perspective, the demand for recreation has continued to grow in the 1980's, but at a somewhat slower pace than in the 1960's and 70's. Changes in population growth, aging of the population, future income levels, and the resource capabilities of the resource base were factors considered in developing the indexes of future use at the national level

Since data was available by activity, rather than ROS classes, the approach used in this analysis was to analyze historical RIM data by activity and project future use by activity Once this step was completed, the use by activity was converted to use by ROS classes based on (1) the average ROS use patterns developed between the years 1984 and 1986 and (2) indexes of growth by activities in the 1990 Draft RPA assessment

The RIM data included hunting and fishing activities All fishing (activities 31.1 - 31 4) and big game hunting (activity 61 1) were deleted from the data, because they are addressed in a separate wildlife demand analysis These activities were included in the activity analysis for information only, but were not included in the development of indexes of expected future use

The historical trend of activities was analyzed using LOTUS 123 spreadsheet and regression analysis. Several of the activities were presented in graph form to help gain a visual picture of the historical pattern of use over time.

The 1990 RPA indexes of use for the Southeast were utilized to develop initial recreation use projections. Historical trends and factors such as population and membership in recreation related organizations were reviewed as potential modifiers of the basic approach and applied as appropriate. The specific steps in the approach were.

1. Analyze historic recreation use trends through regression analysis and graphics and define a normalized base year.
2. Develop average 1984-1986 RIM activity use by ROS class
3. Develop indexes of expected use by RIM activities based upon Draft 1990 RPA indexes of future use by RPA activities
4. Combine current use by ROS class, with indexes of future use by RIM activities to develop indexes of future use by ROS classes.
5. Evaluate the process and modify as appropriate based upon other factors, including historic RIM trend analysis, local population trends, resource capabilities, and information from recreation-related organizatons.
6. Estimate the *expected future demand* (use) by ROS class

Historical Recreation Use Trends. Recreation use on the Forest has increased from 1 2 million RVD'S in 1966 to 1.8 million RVD's in 1988 The early 1970's and 80's were relatively high growth years, but the increase has maintained a fairly steady pace averaging an increase of 29,315 RVD's or 1 7 percent per year. An R-Square of 7866 indicates a high correlation between time and use The linear trend was checked for statistical significance and the null hypothesis of no significant slope was rejected at the 99% confidence level These statistical characteristics suggest that the linear trend is a good representation of what has happened over the last 23 years

The same general characteristics are found for recreation use trends without big game hunting and fishing The average annual increase is 25,927 RVD's which represents a 1 7% annual rate of growth The R-square value was 8078, and the linear trend was statistically significant at the 99% confidence level

Analysis of individual recreation activities was not nearly as conclusive Twenty-four of the 49 activities had no statistical significance at the 95% confidence level R-squared values were less than .500 for 33 activities Linear trends appeared to show growth in a few activities, but the analysis at the activity level provided little definitive information about historical trends

Total reported dispersed recreation use in 1988 was 1,475,000 RVD's. This use was slightly greater than the historical trend line value developed through the regression analysis. Regression analysis showed recreation use in 1988 at 1,378,000 RVD's. The Forest used the trend value developed from the regression analysis to represent a normalized base for 1988 The indexes of future use were then applied to this base.

Recreation use was heavily concentrated in the "Roaded Natural" ROS class This class had 83 1 percent of total use and increased to 86.3 percent after big game hunting and fishing activities were removed

The RPA index of future demand (Draft 1990 RPA, Page II-43) was converted to RIM activities based upon professional judgement by the Recreation and Planning Staffs in the Regional Office The indexes of future use were combined with current use by RIM activities to develop indexes of use by ROS class Table B-14 provides the indexes by ROS classes used to make future projections

Table B-14.
Indexes of Future Recreation Use by ROS Class

Future Periods	P	SPNM	SPM	ROS Classes RN	R	U	Average
1990-2000	120	107	109	113	114	N/A	112
2000-2010	139	115	119	125	129	N/A	124
2010-2020	158	124	130	138	144	N/A	137
2020-2030	180	132	141	152	162	N/A	151
2030-2040	196	138	149	162	176	N/A	161

Predicting future demand using three other trends was reviewed These trends were historic RIM data, U S Bureau of Census population trend estimates, and historic club membership trends If historic RIM trends were extended to the year 2035, an index value of 181 would represent expected future use in the 2030-2040 period This is a higher value than expressed in the above table by the RPA indexes. The historic trend indicated a positive growth that is expected to continue, but at a somewhat reduced pace (Draft 1990 RPA, p II-2 thru II-9) Two of the main factors contributing to the expected decline in the rate of growth are declining population growth trends and an aging population These factors are expected to influence the Forest's recreation use. The RPA figures are more consistent with what is expected to happen in the future, so the historic trend was not used.

Population projections developed by the Forest for local, regional, and national areas indicate a local growth rate slightly less than the national trend, and a regional trend slightly greater than the national trend

The State of Virginia is projected to experience a population growth pattern similar to the National average. The Forest is in close proximity to a number of large metropolitan areas. These non-resident use pressures have existed in the past and are expected to continue in the future Substantive differences in other population characteristics are not anticipated Thus, the national assumptions about population influence on future recreation use, established in the Draft 1990 RPA, were considered to be a good representation of what can be expected on the Forest

Recreation-related organizations were contacted, and one item often provided was a history of membership growth The Appalachian Trail Conference provided information on membership as far back as the mid 1930's and showed membership growing from approximately 1000 members in the early 1960's to nearly 20,000 in 1988 The Virginia Four-Wheel Drive Association was formed in 1981, and has grown in membership to almost 1000 families and 25 clubs Motorcycle registrations in the United States have increased from about 1/2 million in 1960 to over 5 5 million in 1975. These numbers have declined to 5 0 million currently (1986)

Historically, these membership growth trends have far exceeded use trends nationally or on the Forest Based upon the Forest's professional judgement, trends in membership are currently not considered a good basis for direct extrapolation of future use These trends will continue to be monitored and evaluated.

Future Recreation Demand Recreation on public lands is not a market good Fees, where charged, are considerably less than fair estimates of market value Since current fees are very low relative to the benefits received by the public, the potential for increasing use by lowering the price is minimal Thus, current and expected future use represents the upper limit when a value is assigned Given this situation, the dispersed recreation use figures in Chapter 3 are the upper limits of the horizontal demand curve assumption. Thus, in the revision, goods and services produced by the various Forest Plan alternatives were not valued above the final demand estimates Implied in this approach is the assumption that the horizontal demand approximation adequately represents the price-quantity relationship over the range specified

The information analyzed provided a basis for making projections of increased future dispersed recreation use Different rates of growth were found using different approaches The Forest assumed the rates of growth from the Draft 1990 RPA indexes best reflected future recreation use on the Forest The historic-use trends are expected to slow down consistent with expected future population growth and an aging population Chapter 3 of this EIS presents the estimates of future dispersed recreation use on the Forest used in the Revision effort

Off-Highway Recreation Demand

Off-highway vehicle (OHV) use comprises an important part of the motorized recreation opportunities available on the Forest Several documents were reviewed in considering demand for OHV opportunities on the Forest The primary documents referenced were the current Statewide Comprehensive Outdoor Recreation Plans (SCORP) for Virginia and West Virginia. *The West Virgina SCORP, 1988-199* did not identify off-highway vehicle recreation use as a key issue or activity and therefore did not quantify demand Therefore, demand estimates for the George Washington National Forest are extrapolated from the data found in the *1989 Virginia Outdoor Plan*, page 246, table 33, using the percentage of the Forest located in Virginia (90%)

Developed Recreation Demand

Demand for developed recreation was also calculated using 1990 RPA indices from *An Analysis of the Outdoor Recreation and Wilderness Situation in the United States 1989-2040* (page 59) Chapter 3 of this EIS presents the estimates of future developed recreation use on the Forest

Table B-15.
1990-2040 Index of Future Developed Recreation Use

PERIOD	RPA INDEX
1990-2000	120
2000-2010	138
2010-2020	158
2020-2030	178
2030-2040	195

Wilderness Demand

Demand for wilderness was estimated based on the following procedure.

1) Use information was collected within existing wilderness areas for the years 1988 to 1991

2) This information was then averaged to estimate the 1990 base year.

3) Demand projections were made for the decades 2000 to 2040 based on indicies provided by Carter Betz of the Outdoor Recreation and Wilderness Assessment Research Group, Southeastern Forest Experiment Station

Table B-16
1990-2040 Index of Future Wilderness Use

PERIOD	INDEX
1990-2000	112
2000-2010	125
2010-2020	139
2020-2030	153
2030-2040	163

Wildlife Demand

This analysis developed projections of demand for wildlife and fish from 1990 through the year 2040 The demand for wildlife included big game (bear, deer, and turkey), small game(squirrel and grouse); nonconsumptive(wildlife viewing); and waterfowl, migratory, and furbearing game The demand for fish included both cold and warm water fisheries

Big Game and Small Game

The main sources of game data were the State game agencies. Virginia Department of Game and Inland Fisheries (VDGIF) and the West Virginia Department of Natural Resources (DNR) Nonconsumptive data was drawn primarily from the *1985 National Survey of Fishing, Hunting, and Wildlife- Associated Recreation* (U S Department of Commerce, Bureau of the Census and U.S Department of the Interior, Fish and Wildlife Service 1987)

To hunt or fish in Virginia and West Virginia on National Forests, a special National Forest Stamp must be purchased

Two National Forests are located within the state of Virginia, with the GW representing 59% of the total Recent separation of hunting/fishing ratios indicate a 70/30% split between the two Using these percents it can be estimated the amount of stamp sales for hunting on the GW that have occurred over the years

For the last year of data available (1991), stamps sold for hunting on the GW are estimated to equal 72,463

From VDGIF surveys (seasons of 83/83 and 84/85) and specifically in reference to their Northern Mountain Region which closely approximates the GW boundaries, data was gathered to ascertain the % of days afield hunting the various game species Of those pertinent to the GW are the deer, turkey, squirrel, bear and grouse Other species make up an insignificant portion of hunting on the GW

From this data it can be estimated that among the above mentioned species,
the ratio of days afield can be broken down as follows

Species % of days afield by hunters
Deer 46 0%
Turkey 22 5%
Squirrel 21 0%
Bear 06.0%
Grouse 04 5%

West Virginia DNR demand projections are very similar to data from Virginia and include the following.

Deer 50%
Squirrel 20%
Turkey : 16%

Grouse · 07%
Raccoon . 06%
Bear included with raccoon

For the hunting season 1991, no data was available for West Virginia Therefore an estimate of 129,429 Forest stamps was made based on the average annual percent change from 1981 to 1988 The GW contains 10 23% of National Forest lands in West Virginia and it is estimated that 70% of the stamp sales are for hunting Therefore 129,429 x .1023 x 7 = 9,268 stamps sold in WVA for hunting on the GW

In a recent survey of Virginia hunters by Wright, it was ascertained that those using public lands spent an average of 10 days hunting on public lands

According to 1990 RPA figures, the average hunting day afield is equal to seven hours per hunting day and that it can be converted to a RVD day for purposes of deriving an economic value· (5833, an RVD is equall to 12 hours).

Below is a summary of estimated current hunting on the GW, as estimated from the latest data available

GW/VA· 72,463 hunters in GW/VA (as indicated by stamps sold)
WVA · 9,268 hunters in GW/WVA (as indicated by stamps sold)
Total 81,731 hunters on the GW

VA.		WVA		Totals		%'s
Deer	33,333	Deer	4726	Deer	38,059	46 57
Turkey	16,304	Turkey	1483	Turkey	17,787	21 76
Sq	15,217	Sq	1854	Sq	17,071	20.89
Bear	4,348	Bear	556	Bear	4,904	6 00
Grouse	3,261	Grouse	649	Grouse	3,910	4 78

Predicted Hunting Trend for the Planning Period

For Virginia, the past 10 years echos the previous decade, showing a slow decline of National Forest Stamps sold The past ten years sales exhibit an average annual decline of 0 172%

For West Virginia, data is available for an 8 year period and indicates a 1.64% annual decline in stamp sales According to Monongahela National Forest Biologist Harry Pawelczyk (pers communication 5/12/92) this decline may in part reflect an increasing population of deer on private lands and a subsequent decline in the National Forest's market share of the state's deer herd. This may also be the case for Virginia as well as there has been an increase in deer populations throughout the state

A slow, but long term nationwide decline in the number of hunters have been noted by many researchers. A slow but steady decline has also been predicted.

A decline in GW Virginia hunters, reflecting the past decade trend, of 0 172% annually is predicted for the foreseeable future A 1 64% annual decline in GW WVA hunters, reflecting the past 8 years trend, is predicted for the foreseeable future. The trends for hunting stamps attributed to the GWNF are as follows.

Current .VA 72,463 WVA 9,268 Total· 81,731 = 100%
10 years ·VA 71,351 WVA 8,006 Total 79,357 = 97 10%
20 years ·VA 70,135 WVA 6,804 Total. 76,939 = 94 14%
30 years .VA 68,940 WVA 5,782 Total· 74,722 = 91 42%
40 years .VA 67,766 WVA 4,914 Total· 72,680 = 88 93%
50 years .VA 66,611 WVA 4,176 Total· 70,787 = 86 61%

This predicted decline in hunting stamps is consistent with national projections made in the RPA document *An Analysis of the Wildlife and Fish Situation in the United States 1989 - 2040* The medium and low scenarios for big game and small game project decreases in use over the next 50 years (see page 65) The statement is also made that "Despite scenario variation in expected participation levels, all scenarios tend to indicate that hunting, relative to nonconsumptive recreation and fishing, is expected to become less important to the outdoor recreationist." Based on these national trends and the local hunting stamp data the Forest believes the projections are a reasonable estimate of what might happen in the future

Nonconsumptive (Wildlife Viewing)

Nonconsumptive data are the most difficult to obtain for this analysis. There are no check stations for those who observe, photograph, or feed wildlife on the Forest No permit nor license is required for these activities, so no state level data base exists from which to select and survey nonconsumptive users. The most comprehensive information on this subject is compiled in the *1985 National Survey of Fishing, Hunting, and, Wildlife-Associated Recreation* (U.S Department of Commerce, Bureau of the Census and U S. Department of the Interior, Fish and Wildlife Service· 1987). However, this data was used because the results were given in terms of activities on "public land "

The source document for Nonconsumptive WUDS is Brown and Connelly (1988) This document converts primary nonresidential nonconsumptive data from the 1985 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation (USDI and USDC, 1987). Primary nonresidential nonconsumption is observing, feeding, or photographing wildlife more than one mile away from one's home *(Brown and Connelly, 1988 Page 1). The national survey gives this data in terms of visitor hours to "public" lands Brown and Connelly* convert these to visitor hours to national forest lands in Virginia The analysis apportioned these hours to the GW by its percent of total national forest acres (GW versus Jefferson) The 1980 base is 168,567 This was projected for the years 1990, 2000, 2010, 2020, 2030, and 2040 using the following RPA indices· 1990 - 169, 2000 - 182, 2010 - 193, 2020 - 208; 2030 - 224; and 2040 - 240

Nonconsumptive wildlife are valued by the recreation use that occurs for dispersed recreation. Thus, to avoid double counting no value is applied to nonconcumptive wildlife WUDS.

Migratory, Waterfowl, and Furbearing Game

Migratory, waterfowl, and furbearing wildlife do not contribute significantly to wildlife use on the Forest according to Forest, Virginia Department of Game and Inland Fisheries (VDGIF), and the Department of Natural Resources (DNR) wildlife biologists The Forest biologist notes that maybe 500 WUDS are generated annually from waterfowl hunting. Improvements for waterfowl habitat on the *Forest have been made However, the capacity to continue to do so is limited*

Fishing Demand

Cold Water Fisheries

The demand for cold water fishing was estimated from National Forest Stamp data and information from a 1985 VDGIF funded survey of Virginia Trout Anglers (Williams et al, 1986)

The following process was followed to estimate demand

First, National Forest Stamp sale data were collected from 1981 to 1991

Second, the stamp sales were converted to Fish User Days (FUDs) for each year This was based on the following formula Number of stamp sales x 30 x 15 days afield / stamp x .290 WUD's / days afield The 30 is the proportion of stamp sales assumed to be purchased primarily for cold water fishing The 15 days afield / stamp was from data collected during the Virginia Trout Anglers Survey (Williams et al, 1986) This means the average trout stamp purchaser fished for stocked and native trout 15 days per year. The 290 FUD's / days afield the average person spends 3 5 hours in a 12-hour day to fish

Finally, projections for the years 2000, 2010, 2020, 2030, and 2040 were estimated based on RPA indices for fish

Warm Water Fisheries

The demand for warm water fishing was estimated by using creel survey data from lakes and streams on the George Washington N F (VDGIF) It was therefore estimated that an additional 25% of the FUDS projected for cold water fishing were for warm water fishing

Conclusion

Projected wildlife and fish numbers can be found in Chapter 3 of the EIS or the process record *Wildlife and Fish Demand for the George Washington N F.*

Present Net Value

The 1982 NFMA implementing regulations (36 CFR 219 1) state that Forest Plans must " ..provide for multiple-use and sustained yield of goods and services from the National Forest System in a way that maximizes long-term net public benefits in an environmentally sound manner " Net public benefits is defined as the overall value to the Nation of all outputs and positive effects (benefits) less all associated inputs and negative effects (costs) whether they can be quantitatively valued or not

Present net value (PNV) is one of the criteria used to determine net public benefits (NPB) in benchmarks and alternatives PNV is the difference between the discounted value of all outputs which were assigned a price in the Revision and all Forest Service management and investment costs over the analysis period PNV converts all costs and benefits over the 150-year planning period to a common point in time

Other benefits of public land management cannot be measured using dollar values These other benefits - nonpriced benefits - are another criteria used to determine NPB

Each benchmark and alternative was designed and analyzed to achieve its goals and objectives in a manner that produced the greatest PNV while meeting all specified costs and objectives for nonpriced benefits Thus, the PNV of each alternative estimated the highest value of priced benefits while accounting for the costs of producing priced benefits, non-priced benefits, and meeting management requirements The PNV of each alternative can then be compared directly, even though the actual costs and benefits occur at different times

Two parameters are used in PNV analysis

1 Base Year Dollars — All monetary values entered into FORPLAN were in 1989 dollars A factor of 1 08 was used to convert 1989 dollars to the current 1991 dollars using GNP price deflators

2 Discount Rate — A 4 percent discount rate was used It approximates the return on long-range investments above the rate of inflation (Row and others, 1981). All costs and benefits were discounted from the midpoint of each decade

The PNVs for the benchmarks and alternatives are shown in the Tradeoffs Among Benchmarks and Tradeoffs Among Alternatives sections of this Appendix.

Suitability Analysis

The Forest was analyzed for its ability to produce timber on a sustained yield basis in what is called a timber suitability analysis The suitability analysis has a number of stages which are

1 Determination of lands tentatively suited for timber production
2 Examination of the financial and economic efficiency of tentatively suited timber lands.
3. Determination of lands suited for timber production.

Stages one and two are discussed in this appendix. Stage three, the determination of lands suitable for timber production, occurs in the Record of Decision (ROD)

The process the Forest followed can be found in process record *Incorporation of the NFMA Requirements for Timber Resource Land Suitability into the Revision of the George Washington Forest Plan*, dated 3/29/91

Stage 1 Determination of Lands Tentatively Suitable For Timber Production

Table B-17 from the process record *Incorporation of the NFMA Requirements for Timber Resource Land Suitability into the Revision of the George Washington Forest Plan* displays an approximate relating of the Stage 1 suitability analysis for the revision with the original Stage 1 suitability analysis

Table B-17.
Comparison of Stage 1 Suitability

Category of Land	Forest Plan Acres	Revision Acres
1 Total National Forest Land	1,055,525	1,059,907
2 Non-Forest Land	9,719	10,979
3 Forest Land	1,045,806	1,048,928
4. Withdrawn	33,307	34,469
5 Not Capable of Producing Crops of Industrial Wood	64,922	55,958
6 Irreversible Damage likely to occur	48,502	40,255
7 Inadequate Response Information	0	2,751
8 Can't Restock Within 5 Years	0	442
9 Tentatively Suitable Forest Land	899,345	915,053
10 Unsuitable Forest Land	156,180	144,854

The disparity between these two sets of acreages has arisen for two reasons· (1) a net increase in National Forest acreage (including some adjustments through land exchanges) and (2) areas that have been re-inventoried since the completion of the Forest Plan

For an explanation of the criteria used for defining items 5 through 8 and what technology is available to meet 36CFR 219 14(a)(2), the process records *Incorporation of the NFMA Requirements for Conserving Soil and Water Resources and not Allowing Significant or Permanent Impairment on the Productivity of the Land into the Revision of the Land and Resource Management Plan for the George Washington National Forest* and *Incorporation of the NFMA Requirements for Timber Resource Land Suitability into the Revision of the Land and Resource Management Plan for the George Washington National Forest* should be referred to

Stage 2 Examination of Financial Efficiency of Lands Tentatively Suitable for Timber Production

The financial analysis reveals the present net value (PNV) for different FORPLAN analysis areas For the purpose of this financial analysis, PNV is a measure of discounted timber benefits less discounted timber management costs The actual PNV analysis consisted of a FORPLAN run which examined all of the management intensities for all of the FORPLAN analysis areas This analysis revealed information on over 3,000 options for the FORPLAN analysis areas. This portion of the financial analysis concentrates the relative profitability of different timber management intensities on a limited number of FORPLAN analysis areas with the highest present net values This calculation of PNV for timber assumes the following

1 To limit the number of analysis for comparison purposes, only those analysis areas with a roaded natural or semi-primitive motorized recreation opportunity spectrum and slopes less than 55% are displayed The majority of the lands with positive PNVs, in at least one timber management intensity, fell in these analysis areas The relative ranking of timber management intensities was consistent for all analysis areas

2 Management prescriptions emphasizing timber are used to calculate the timber PNV versus using prescriptions that emphasize other resources On the same FORPLAN analysis area, management prescriptions that use timber harvesting under other resource *emphases contain constraints that reduce the PNV*

3 For mature, immature and damaged/sparse analysis areas, Timber PNV calculations assume the intensity occurs in the first decade with a rotation age of 90 years for hardwoods and 60 years for Pine. The discount Rate is 4%

4 For seedling/sapling analysis areas, intensity occurs in the seventh decade for hardwoods and fourth decade for pines Rotation ages are 90 years for hardwoods and 60 years for Pine. The discount Rate is 4%.

Based on this financial analysis, the ID Team was able to arrive at the following conclusions·

1. Clearcutting with natural regeneration has the highest PNV for all FORPLAN analysis areas.

2 Clearcutting with site preparation for natural regeneration has a positive PNV for site index 70 or better in the Upland Hardwood, Cove Hardwood and White Pine Working Groups

3 Shelterwood with natural regeneration has a positive PNV for site index 70 or better in the Upland Hardwood Working Group

4. Group selection and individual tree selection have a negative PNV for all FORPLAN analysis areas

5. All harvest methods have a negative PNV on Virginia and Yellow Pine Working Groups.

6. The PNV is negative for the Upland Hardwood Working Group with a site index 50 or lower.

7 Clearcutting with conversion of hardwood stands to white pine has a negative PNV

The second step in the Stage 2 Timber Resource Land Suitability was to review these FORPLAN analysis areas to determine which bore "similar management costs and returns". The ID Team ranked the FORPLAN analysis areas in order of PNV (from high to low) This ranking is based on the assumption that clearcutting with site preparation and natural regeneration is the harvest method applied If other methods were chosen, the ranking would be the same but the PNV would differ.

The following conclusions can be drawn from this ranking of FORPLAN analysis areas

1 FORPLAN analysis areas in the Cove Hardwood Working Group with an ROS Class of roaded natural or semi-primitive motorized, slopes less than 55% and a stand condition class of "mature" have the highest PNV.

2. In general, FORPLAN analysis areas in the Upland Hardwood Working Group on site index 70 or better, analysis areas in the Cove Hardwood Working Group and analysis areas in the White Pine Working Group with an ROS class of roaded natural or semi-primitive motorized, slopes less than 55% and an immature or mature condition class have a positive PNV

3 FORPLAN analysis areas in the Upland Hardwood Working Group with a site index of 40 within a ROS class of roadless, slopes greater than 55% and a condition class of immature or mature have the lowest PNVs

4 272,465 acres (about 27% of the Forest) lie in FORPLAN analysis areas with a positive PNV.

Special Analysis of Timber Fixed Cost

NFMA and its regulations do not require an analysis of fixed costs. Timber Staff Office James Sitton performed an analysis on fixed costs since (1) the Statement of Timber Sale Revenues and Expenses in TSPIRS also tracks this information and (2) any definition of a "below-cost timber program" must deal with the handling of fixed costs

The "fixed" costs of the Timber Program are not fixed in a classic economic sense. Rather, they contain costs which vary according to the relative size of the timber volumes offered and costs of administering any timber program.

Table B-18 reflects the estimated fixed cost for the various "offer" levels.

Stage 3 Identification of Suitable Timber Lands

The results of this stage (amount of suitable timberland) vary by alternative and are located in Chapter 2 of this EIS The final decision on the acres of land suitable for timber production occurs in the Record of Decision accompanying the Final EIS

Table B-18.
Fixed Costs at Different Offer Levels

	Offer Level 1-15 MMBF	16-29 MMBF	30-34 MMBF	35-45 MMBF	45-60 MMBF	61-70 MMBF
1. Personnel						
Timber Staff	33%	66%	75%	100%	100%	100%
	$17,186	$34,373	$39,060	$52,080	$52,080	$52,080
Sale Forester	75%	100%	100%	100%	100%	100%
	$36,900	$49,200	$49,200	$49,200	$49,200	$49,200
Silviculturist	0%	50%	75%	100%	100%	100%
	0	$24,600	$36,900	$49,200	$49,200	$49,200
Logging Eng	0%	25%	25%	50%	75%	100%
	0	$12,750	$12,750	$25,500	$38,250	$51,000
Resource Assist.	75%	100%	100%	100%	100%	150%
	$24,000	$32,000	$32,000	$32,000	$32,000	$48,000
Clerk/Typist	0%	33%	60%	100%	100%	100%
	0	$5,373	$9,770	$16,283	$16,283	$16,283
SUBTOTAL	$78,086	$158,296	$179,680	$224,263	$237,013	$265,763
2. ET 112-Planning	25%	50%	75%	100%	100%	100%
	$6,154	$12,307	$18,460	$24,614	$24,614	24,614
3 ET 111-Inventory	17,500 acres	35,000 acres	35,000 acres	50,000 acres	70,000 acres	70,000 acres
(@ $2 25 per acre)	$39,375	$78,750	$78,750	$112,500	$157,500	$157,500
4. SO Assessments	66%	75%	80%	100%	125%	150%
	$100,484	$114,186	$121,798	$152,248	$190,310	$228,372
TOTAL	$224,099	$363,539	$398,688	$513,625	$609,437	$676,249

Social and Economic Impact Analysis

A computer model called IMPLAN 2 was used to estimate income and employment effects on the economic impact area on the Forest. IMPLAN 2 is an input-output model that the forest service developed for use in estimating direct, indirect and induced employment and income effects for a regional economy due to forest service activities and expenditures. Calendar year 1985 data were used This estimate was derived in the form of response coefficients for timber, recreation, wildlife, expenditures, and county returns. The response coefficients were multiplied by resource outputs by alternative to estimate the income and employment effects Table B-19 displays the coefficients

Table B-19.
IMPLAN Response Coefficients

Activity	Response Coefficient Jobs	Income
Timber (MMBF)		
Softwood sawtimber	9 95	.15869 MM$
Softwood roundwood	5 65	10305 MM$
Hardwood sawtimber	12 59	18750 MM$
Hardwood roundwood	4.08	07443 MM$
Expenditures (MM$)	25 24	61398 MM$
Twenty-Five Percent Funds (MM$)	30.31	.79710 MM$
Developed Recreation (MRVDs)	0 573	01265 MM$
Dispersed - Hunting & Fishing (MRVDs)	1.583	03777 MM$
Dispersed - Other (MRVDs)	1.042	.02122 MM$
Wilderness (MRVDs)	0 271	00564 MM$

The timber response coefficients include the effects of selling stumpage from the GWNF on income and employment within sectors 160, 161 and 162 in the IMPLAN model These sectors include independent loggers and local sawmill operators The direct and indirect effects on the pulp and paper industry are not included in the model. At present, only 5% of the volume needed by this industry comes from GWNF land. The impact of selling GWNF stumpage on jobs and income in this industry is small at best However, to better respond to this question, a sensitivity analysis was done using the IMPLAN model and including the pulp and paper industry Based on data supplied by WESTVACO and assuming the stumpage could not be obtained anywhere else, the response coefficients of 31 73 jobs and 1.119 MM$ for every 1 MMBF of hardwood roundwood sold by the GWNF up to 15 MMBF were developed

Returns to the U S Treasury were also calculated for each decade These returns were the sum of the following

- Timber returns calculated as stumpage value of timber
- Developed recreation returns collected from campgrounds
- Special use returns based on money collected from oil and gas leases

Returns to States and therefore Counties were calculated as 25 percent of the returns to Treasury

Economic Diversity and Dependency Assessment

Economists in the Regional Program Development and Economic Analysis Group have prepared a process paper entitled *Economic Diversity and Dependency Assessment.* The purpose of this paper was to describe the structure of the local economy and its relationship with the forest resource They found the local economy to be relatively diverse with no particular industry "dominating" the economy. They reached the following conclusion in this paper

> "Given the concentration of forest resource-related sectors found in the analysis, and the role of National Forest system lands to the total forest resource base, changes in National Forest resource outputs are not expected to cause heavy impacts on the local economy The economy's relationship with the forest resource does suggest, however, some direct impacts would be expected "

Development of Management Requirements

Management requirements (MRs) are directed toward producing a viable level of resources for both the short - and long-term The requirements stem from the National Forest Management Act as interpreted by the implementing regulations (36 CFR 219 27) The following sections of 219 27 contain the basic direction for MRs.

1 Resource Protection
2. Vegetative Manipulation
3 Silvicultural Practices
4 Even-Aged Management
5 Riparian Areas
6 Soil and Water
7. Diversity

All but a few MR's are accomplished through the use of standards which are incorporated into applicable management area prescriptions (refer to the process paper *Forest-Wide Standards*) MR's which aren't incorporated into management area prescriptions are analyzed in FORPLAN. The process paper *Methods to Attain Management Requirements* explains how the ID Team met each of these legal requirements.

For the purpose of simplifying the discussion of the portions included in the FORPLAN model, other requirements of the NFMA Regulations incorporated into the FORPLAN model are also discussed.

Nondeclining Yield & Sustained-Yield Link. (36 CFR 219 16) The Forest is currently selling timber based on a policy of nondeclining even-flow The constraint in the FORPLAN model is designed to ensure that the harvest levels in each decade are equal to, or greater than, the harvest in the previous decade. The harvest level in the last decade of the planning horizon must be less than, or equal to, the long term sustained-yield calculated for the alternative

Ending Inventory Constraint (36 CFR 219 16) This constraint attempts to ensure the total inventory volume left at the conclusion of the harvest scheduling planning horizon (150 years) is sufficient to maintain the harvest pattern established for the given alternative

Rotations at CMAI· (36 CFR 219.16) This constraint is intended to control the minimum age at which a timber stand can be regenerated. The minimum is determined by calculating the age at which the stand achieves 95 percent culmination of mean annual increment of timber volume growth The constraint is applied through the individual prescription data as input to the FORPLAN model See the previous discussion of rotation ages elsewhere in this appendix

Dispersion· (36 CFR 219 27 (b) & (d)) These constraints insure that individual cuts created by application of even-aged silviculture will conform to the Regional Guide direction on dispersion of openings

The percentages are "less than or equal to" constraints The model is limited to harvesting only a portion of any vegetation type within a single decade The portion is based on the appropriate management area prescription, the rate of growth of the given timber species, and the applicable standards The constraints also help most resource protective requirements related to water and soil

Wildlife and Fish· (36 CFR 219 27 (a)) All indicator species were evaluated for habitat requirements estimated to be necessary to maintain populations A management requirement constraint was used to provide habitat for the common flicker The constraint was applied so that an appropriate amount of vegetation was present in the earlier structural stages.

Soil and Water· (36 CFR 219 27 (a)) Costs associated with soil and water protection were included in all prescriptions The timber harvest dispersion constraints are also used to prevent excessive sediment production Additionally, forest-wide soil and water standards (See Forest Plan, Chapter II) give direction which ensures the Forest will meet management requirements

Benchmarks

Benchmarks approximate maximum economic and biological resource production opportunities, are useful in evaluating the compatibilities and conflicts between individual resource objectives, and help define the range within which integrated alternatives can be developed The following benchmarks were thus developed.

CUR - Current Level Benchmark

This benchmark provides for management using the current plan, adjusted to incorporate changes necessary to meet current management direction The benchmark estimates the capability of the planning areas to provide for a wide range of goods, services and other uses from the present land allocation. This benchmark was the same as Alternative 2 This benchmark meets all requirements specified in the regulations (36 CFR, Part 219).

TIM - Maximum Timber Benchmark.

This benchmark was used to defined the maximum timber output possible for the first decade subject to the following specifications·

1. The objective function maximizes timber in the first decade with a rollover to maximize present net value

2 Apply management requirements

3 Apply nondeclining yield

4 Includes all tentatively suitable land

MKT - Maximum Present Net Value with Market Values Only Benchmark.

The purpose of this benchmark was to estimate the mix of resource uses and determine a schedule of outputs and costs that would maximize the present net value of those outputs that have an established market price. These outputs include market prices for timber, range, minerals, and developed recreation. The following specifications were applied·

1. The objective function maximizes present net value where only market outputs are valued

2. Apply management requirements.

3. Apply nondeclining yield.

4 Includes all tentatively suitable land

5 Timber demand cutoffs are applied based on timber demand + 50% This means no value will be applied to the volume of timber that exceeds timber demand + 50%

PNV - Maximum Present Net Value with Assigned Values Benchmark.

The purpose of establishing this benchmark was to estimate the mix of resource uses and a schedule of outputs and costs that would maximize the present net value of outputs assigned a monetary value The following specifications were applied.

1 The objective function maximizes present net value where both market and nonmarket outputs were valued

2 Apply management requirements.

3 Apply nondeclining yield

4 Includes all tentatively suitable land.

5 Timber demand +50% cutoffs were applied Demand cutoffs were also applied for big game wildlife (i e bear, deer, and turkey)

MIN - Minimum Level Management Benchmark.

This benchmark represents the minimum level of management needed to maintain and protect the unit as part of the National Forest System The following specifications were applied

1. The objective function maximizes present net value where both market and nonmarket outputs were valued

2 Minimum level was the only prescription applied to all acres except existing wilderness.

GAM - Maximize Big Game Wildlife Benchmark

This benchmark represents the maximum resource production opportunity for producing Deer, Bear and Turkey on the Forest The following specifications were applied.

1. The objective function maximizes deer, bear and turkey WUDS for 5 decades with a rollover to maximize present net value where both market and nonmarket outputs are valued.

2. Apply management requirements

3 Apply nondeclining yield.

4. Includes all tentatively suitable land

5 Timber demand +50% cutoffs were applied Demand cutoffs were also applied for big game wildlife (i e bear, deer, and turkey).

SPM - Maximize Semi-Primitive Motorized Recreation Benchmark

This benchmark represents the maximum resource production potential for producing Semi-Primitive Motorized Recreation where roads are open seasonally or year round. The following specifications were applied·

1. The objective function maximizes semiprimitive motorized recreation for 5 decades with a rollover to maximize present net value where both market and nonmarket outputs were valued.

2 Apply management requirements.

3 Apply nondeclining yield

4 Includes all tentatively suitable land.

5 Timber demand +50% cutoffs were applied. Demand cutoffs were also applied for big game wildlife (i e. bear, deer, and turkey)

SPNM - Maximize Semi-Primitive Non-Motorized Recreation Benchmark.

This benchmark represents the maximum resource production potential for producing Semi-Primitive Non-Motorized Recreation This benchmark was the same as Alternative 3 For the specifications of how this alternative was run refer to the Formulation of Alternatives Section of this Appendix

WLD - Maximize Wilderness Benchmark.

The purpose of this benchmark was to evaluate the impacts of a maximum wilderness recommendation. This benchmark was the same as Alternative 9. Some of the important specifications that make Alternative 9 a good representation for this benchmark were the following.

1 The objective function maximizes present net value where both market and nonmarket outputs were valued

2. Apply management requirements.

3. Apply nondeclining yield

4 All roadless and wilderness study areas have wilderness prescriptions.

Table B-48 at the end of this document displays the important outputs and effects for each benchmark

FORMULATION OF ALTERNATIVES (STEP 5)

Alternatives within this EIS represent alternative "Forest Plans" for managing the Forest for the next 10 to 15 years Technically, an alternative is a mix of management area prescriptions applied in specific amounts and locations to achieve a desired management emphasis as expressed in goals and objectives.

Overview of Process

The ID Team followed a four step process to formulate a broad range of reasonable alternatives.

Development of Alternative "Themes"

The ID Team prepared an overview of "alternative themes" to which the public responded and provided detailed information on goals, *objectives, desired future conditions and standards that should be associated with the development of each "alternative theme" into* an alternative which might be considered in detail in this EIS The ID Team continued to work with the public in a series of meetings to ensure that the concept behind each alternative had been explored and clarified. Process papers were prepared for each alternative that contain detailed discussions on the purposes, forest-wide standards and management area direction associated with each alternative These process papers are referenced in the alternative discussions on the following pages of this appendix

Initial Management Area or Management Area Prescription Allocation

For each alternative, the ID Team prepared an initial allocation of different portions of the Forest to management area prescriptions which best responded to the goals, objectives and desired future condition. The public was also afforded an opportunity to provide information on potential management area prescription or management area allocation which offered the best resolution of issues within different alternatives.

For each stand in the CISC data base, a management area designation was coded GIS was used to code each stand linking a set *of hierarchical "rules" with inventory or other data for each alternative. This set of rules conformed to the general theme of each* alternative Public input was digitized in this step, thought of as an inventory data, and used in developing the alternatives For instance, information on specific locations of ATV areas was provided by ATV enthusiasts. These locations were assigned a management area emphasizing motorized recreation (Management Area 11) in various alternatives Likewise, some roadless area assignments varied between being recommended for wilderness or being intensively managed for timber.

FORPLAN Analysis

Since each stand in CISC also had an analysis area identifier associated with it, the acres by management area were summed across each analysis area This acreage limitation (allocation constraint) was then modeled in FORPLAN using the coordinated allocation choice section of the model

FORPLAN was used to estimate the goods and services that could actually be produced by each alternative Cost efficiency of the alternative was assured by the use of FORPLAN, and by use of the "Maximize PNV" objective function. Although initially assigned a prescription within a given management area, FORPLAN was still given the option of picking one of the other various management prescriptions (Level 8 identifiers) within the broader emphasis (Level 7 identifier) from intensive timber management to minimum level management.

Mapping the Alternatives

Given the same set of rules, GIS produced a map of the alternative allocations. Alternative maps are provided with this EIS

Constraints Common to All Alternatives

Constraints identified as "Management Requirements" were applied to all alternatives. Additional constraints common to all alternatives were applied to insure an implementable solution.

The main constraint was the land allocation constraint represented when the "rules" were applied and the data base populated. For example, the acres of tentatively suitable timberland varied by alternative depending on the pre-determined land allocation Specifically, only stands (analysis areas) with a site index of 60 or greater *and* within pre-allocated management areas 7, 15 or 16 were allowed to be harvested in alternative 13. These allocation constraints varied by alternative They were built into each alternative when the initial management area assignments were given to each analysis area in CISC using process described above. Constraints common to all alternatives follow.

Constraint. Insure that the timber harvest volume does not decline from period to period Insure in the last decade of the planning horizon that the timber harvest level is less than or equal to long run sustained yield calculated for the alternative.

Purpose· To comply with Federal regulations

Rationale· Without the constraints, harvest levels could rise and fall erratically allowing industry to expand greatly one decade, only to be put out of business the next. Nondeclining yield constraint prevents these erratic shifts.

Constraint Ensure the total forested inventory volume left at the end of the planning horizon (150 years) is sufficient to maintain the harvest pattern established for a given alternative.

Purpose· To comply with Federal regulations.

Rationale. In the absence of this constraint, the FORPLAN model would have no incentive to leave enough inventory of trees at the end of 150 years to sustain timber harvest levels into perpetuity.

Constraint· Provide to timber harvests at or above culmination of mean annual increment (CMAI).

Purpose. To assure timber is not harvested when growing at its maximum rate.

Rationale· Maintain high productivity of stands and abide by Forest Service policy and the NFMA

Constraint· No more than 45% of the volume harvested in decade 1 can occur on productive class 3 or better lands in Upland Hardwood, Cove Hardwood, and White Pine Working Groups

Purpose: To insure that the volume harvested can reasonably be expected to be achieved.

Rationale The 45% reflects the assumption that for most alternatives, productive Class 3, or better lands, compose about 45% of the suitable land base. Without this constraint, the volume harvested would be 100% from highly productive lands in Decade 1. Viable timber sales cannot be made without this constraint.

Constraint. Of all the acres on the Forest, no more than 7 7% can be in 0-10 year age class (OPEN) for hardwood and 12 5% for pines under VISEAM, WSREAM, RMTEAM, prescription.

Purpose· Minimum Management Requirement for dispersion

Rationale· Minimum Management Requirement for dispersion

Constraint· Of all the acres on the Forest, no more than 8.3% can be in 0-10 year age class (OPEN) for hardwood and 14 3% for pines under TKYEAM prescription.

Purpose: Minimum Management Requirement for dispersion

Rationale Minimum Management Requirement for dispersion

Constraint· Of all the acres on the Forest, no more than 11 1% can be in 0-10 year age class (OPEN) for hardwoods and 16 7% for pines under TMBEAM, BWSTIM and MOTEAM prescription.

Purpose· Minimum Management Requirement for dispersion.

Rationale· Minimum Management Requirement for dispersion.

Constraint. For management prescriptions BWSTIM and TKYEAM at least 7% of the acres allocated must be in 0-10 year age class (OPEN).

Purpose· Ensure enough 0-10 year openings are created to produce the wildlife user days and populations estimated in the yield tables

Rationale: Constraint is necessary for the wildlife yield tables to work properly.

Other constraints were imposed to represent the general theme of a particular alternative. These are typically referred to as discretionary constraints By adding these constraints, the PNV that results is typically reduced, naturally, from what it would have been if these constraints were not applied.

Development of Alternatives

The criteria used to develop each alternative are displayed as the "rules" in the following tables. Each alternative's purpose is described in Chapter 2 of this EIS. The public was heavily involved in allocating the management areas for most of the alternatives

As stated earlier the set of rule is "hierarchical" This means that land is allocated by process of elimination as each rule is sequentially applied The rule in the tables that follow were applied in the order that they are seen

Alternative 2

The ID Team prepared the planning paper *Alternative #2 For Consideration in the Revision of the Land and Resource Management Plan for the George Washington National Forest* to describe the overall purpose of the alternatives, the Forest-wide Standards and the management area prescriptions used in Alternative 2 This planning paper is on file in the process records in the Supervisor's Office.

Table B-20.
Rules for Assigning Management Areas by Order of Priority for Alternative 2 Maps and Acreages

Mgmt. Area	Description	CISC or GIS Data Layer and Codes
4D	Little Laurel RNA Map	LM_Areas = MA 1
8A	Existing Wilderness	LM_Areas = MA 2
6	Appalachian Trial	AT_Corr = T1
12	Water	Cisc ANAL_AREA = ' W__'
13	Lake Moomaw	LM_Areas = MA 11
20B	Utility Corridor/Back Creek	Cisc LNCL = 220 or LM_Areas = MA 12
20C	Communication Sites	Cisc LNCL = 240
1	Existing Wildlife Openings	Cisc LNCL = 250 and Fea_SP = Deer or Grouse
14A	Existing Wildlife Openings	Cisc LNCL = 250 and Fea_SP = Bear or Squirrel
15A	Existing Wildlife Openings	Cisc LNCL = 250 and Fea_SP = Turkey
1	Otherwise rest of Nonforest Cisc ANAL_AREA = '_E0_' or '_EJ_'	
4	Special Biological Niches	SBN layer = All
10C	Wild and Scenic Rivers	W/S layer = All
9	Skidmore,Dolly Ann SMA's	LM_Areas = MA 3
9	Big Schloss SMA	LM_Areas = MA 7
3A	Little River SMA	LM_Areas = MA 6
13	Crab Tr. Falls,Mt Pl SMA's	LM_Areas = MA 19 or 20
14A	Southern Mss SMA	LM_Areas = MA 4
15A	Laurel Fk, Hidden Val & Jackson River	LM_Areas = MA 5, 9, or 17
1	Low Site Index Land in Current Deer of Grouse Areas	[CISC ANAL_AREA LIKE ' F__' OR ' D__' OR MGTY_SITE_CODE <= 040 OR LNCL = 900 OR (LNCL = 821 AND MGTY_SITE_CODE = 050,060)] AND Fea_SP = deer/grouse
15A	Same as above except Fea_SP = turkey	
14A	Same as above except Fea_SP = bear or squirrel	
14A	SPNM ROS Class from the ROS map layer within bear or squirrel feature species map layer	
14B	VQO retention or (foreground and VQO partial retention from VQO map)) and within (bear or squirrel) Fea_SP layer and ROS not equal to SPNM	
14E	Bear or squirrel feature species map layer for all remaining stands	
15A	SPNM ROS Class from the ROS map layer within turkey feature species map layer	
15B	VQO retention or (foreground with a VQO partial retention from VQO map)) and within turkey Fea_SP layer and ROS not equal to SPNM	
15E	Turkey feature species map layer for all remaining stands	
16A	VQO retention or (foreground with a VQO partial retention from VQO map)) and within (deer or grouse) Fea_SP layer and ROS not equal to SPNM	
16	All remaining stands within (deer or grouse) Fea_SP layer	

Constraints Associated With Alternative 2's Theme

In addition to the previously mentioned constraints that were common to alternatives, the following constraint sets were necessary to represent the theme of this alternative

Constraint Acreage allocation constraint by FORPLAN emphases, thus 360,765 acres of the tentatively suitable timberland base is available

Table B-21.
Acreages Assigned to Management Emphases in Alternative 2

Emphases	Acreages
VISUAM, MINLVL	30,454
RMTUAM, RMT, RMTLVL	17,299
RMTEAM, RMT, RMTMVL, RMTUAM	44,163
TKYUAM, MINLVL	36,048
TKYEAM, TKY, TKYMVL, TKYUAM	122,020
BWSTIM, MINLVL	110,781
PRSREN	90,568
VIS	15,113
WLNESS	32,439
DEVREC	1,329
DISREC	11,239
RMT, RMTMVL	134,498
TKY, TKYMVL	209,488

Purpose Limit the land available for various management activities.

Rationale. To model the theme of this alternative

Constraint Cannot harvest more than 25,000 acres by clearcutting in decade 1

Purpose To model current level of management

Rationale Regional Forester's letter of May 18, 1990 limited the amount of clearcutting on the Forest He stated "The use of clearcutting in proposed timber sales will not exceed 2,500 acres per year"

Constraint Cannot harvest more than 4,000 acres by other systems besides clearcutting in decade 1

Purpose To model current level of management as reflected in Forest Plan approved in September of 1986

Rationale. Original Forest Plan limited harvest methods other than clearcutting to less than 4,000 acres per year. See Forest Plan Appendix N, page N-4

Constraint: Dispersion constraint of no more than 11 1% of the acres can be in 0-10 year age class (OPEN) for hardwoods and 16 7% for pines applied to all even-aged prescriptions that harvest timber

Purpose: To model current level of management as reflected in Forest Plan approved in September of 1986

Rationale: To allow timber harvest to occur at current intensity levels

Constraint Cannot allocate more than 5,000 acres to prescribed burning, of this total no more than 20% can be allocated to RMT

Purpose To limit the amount of prescribe burning.

Rationale· The Forest is currently burning about 500 acres annually or 5,000 acres per decade

Constraint. Must harvest 38 MMBF in the first decade

Purpose. To model current level of management as reflected in Forest Plan approved in September of 1986

Rationale· Chief's letter of September 6, 1989 limited the amount of timber that could be offered for sale in any given year He stated: "The annual timber sale offering will not exceed 38 million board feet."

Constraint· Must harvest 83% of the volume in first decade by clearcutting and seed tree; 13% by modified shelterwood, 1% two-staged shelterwood, and 3% group selection

Purpose· Harvest the four year average from 1988-1991 by cutting system in the first decade.

Rationale. To reflect the mixture of cutting systems that have historically been used.

Alternative 3

The ID Team prepared the planning paper *Alternative #3 For Consideration in the Revision of the Land and Resource Management Plan for the George Washington National Forest* to describe the overall purpose of the alternatives, the Forest-wide Standards and the management area prescriptions used in Alternative 3

Table B-22.
Rules for Assigning Management Areas by Order of Priority for Alternative 3 Maps and Acreages

Mgmt. Area	Description	CISC or GIS Data Layer and Codes
1B	Maps from "Deep Ecology" Interested Publics	Alt3_Areas = 1B
2B		Alt3_Areas = 2B
4A		Alt3_Areas = 4A
4B		Alt3_Areas = 4B
4C		Alt3_Areas = 4C
4D		Alt3_Areas = 4D
5B		Alt3_Areas = 5B
6		Alt3_Areas = 6
8A1	SPNM ROS Areas	Alt3_Areas = 2B
8A2	RN ROS Areas	Alt3_Areas = 2B
8B1	SPNM ROS Areas	Alt3_Areas = 2B
8B2	RN ROS Areas	Alt3_Areas = 2B
8C		Alt3_Areas = 2B
13		Alt3_Areas = 13
20B	Back Creek Pumped Storage Area	Alt3_Areas = 20B

Constraints Associated With Alternative 3's Theme

In addition to the previously mentioned constraints that were common to alternatives, the following constraint sets were necessary to represent the theme of this alternative

Constraint: Acreage allocation constraint by FORPLAN emphases, thus the tentatively suitable timberland base is 0 acres

Table B-23.
Acreages Assigned to Management Emphases in Alternative 3

Emphases	Acreages
MINLVL	105,842
PRSREN	386,061
VIS	4,680
WLNESS	552,112
DEVREC	1,329
DISREC	7,107

Purpose: Limit the land available for various management activities.

Rationale. To model the theme of this alternative.

Alternative 4

The ID Team prepared the planning paper *Alternative #4 For Consideration in the Revision of the Land and Resource Management Plan for the George Washington National Forest* to describe the overall purpose of the alternatives, the Forest-wide Standards and the management area prescriptions used in Alternative 4.

Table B-24.
Rules for Assigning Management Areas by Order of Priority for Alternative 4 Maps and Acreages

Mgmt. Area	Description	CISC or GIS Data Layer and Codes
4D	Little Laurel RNA Map	LM_Areas = MA 1
8A	Existing Wilderness	LM_Areas = MA 2
6	Appalachian Trial	AT_Corr = T1
12	Water	Cisc ANAL_AREA = ' W__'
13	Lake Moomaw	LM_Areas = MA 11
20B	Utility Corridor/Back Creek	Cisc LNCL = 220 or LM_Areas = MA 12
20C	Communication Sites	Cisc LNCL = 240
1	Existing Wildlife Openings	Cisc LNCL = 250
1	Otherwise rest of Nonforest	Cisc ANAL_AREA = '_E0_' or '_EJ_'
4	Special Biological Niches	SBN layer = All
3A	Little River SMA	LM_Areas = MA 6
13	Crab Tr Falls	LM_Areas = MA 19
10C	Jackson & North Rivers	WS_RVRS = JACKS or NORTH
10A	Scenic Wild and Scenic Rivers	WS_RVRS = "Scenic" Attribute
10B	Recreational Wild & Scenic Rr	WS_RVRS = "Recreational" Attrib
11A	Skidmore, Dolly Anne, S Mass & Mt Pleasant	LM_Areas = MA 3, 4, or 20
11A	Big Schloss SMA	LM_Areas = MA 7
11A	Laurel Fork or Hidden Valley	LM_Areas = MA 05 or 09 AND Cisc MGTY_SITE_CODE < 060
11B	Rest of Laurel Fork & Hidden Valley	LM_Area = MA 5 or 9
11A	Remaining land w/ Site Index <060 CISC	MGTY_SITE_CODE < 060
11B	Remaining land w/ Site Index =>060 and within (Retention VQO or foreground Partial Retention VQO areas)	
11C	All remaining stands	

Constraints Associated With Alternative 4's Theme

In addition to the previously mentioned constraints that were common to alternatives, the following constraint sets were necessary to represent the theme of this alternative

Constraint Acreage allocation constraint by FORPLAN emphases, thus 478,156 acres of the tentatively suitable timberland base is available

Table B-25.
Acreages Assigned to Management Emphases In Alternative 4

Emphases	Acreages
WSSUAM, MINLVL	2,720
WSREAM, MINLVL	9,457
MOTUAM, MOTMVL	112,116
MOTEAM, MOTUAM, MOTMVL	353,863
MINLVL	7,119
PRSREN	63,479
VIS	15,113
WLNESS	32,439
DEVREC	1,329
DISREC	5,636
MOTMVL	453,885

Purpose Limit the land available for various management activities.

Rationale To model the theme of this alternative

Constraint: Must harvest 40 MMBF in the 1st decade and not more than timber demand +50% for decades 2 to 5 (i.e 80, 86, 89, 89 MMBF/YR).

Purpose To force timber management to occur in the first decade.

Rationale. Without this constraint, timber harvesting would not occur until the third decade when a "Maximum PNV" objective function is used. Constraint needed to meet the desires of publics who want timber harvesting to occur in the first decade at levels necessary to *satisfy demand for timber*

Constraint No more than 1,000 acres can be clearcut and/or seed tree.

Purpose To limit clearcut and/or seed tree harvest systems to no more than 1,000 acres

Rationale. Based on the theme of this alternative

Alternative 5

The ID Team prepared the planning paper *Alternative #5 For Consideration in the Revision of the Land and Resource Management Plan for the George Washington National Forest* to describe the overall purpose of the alternatives, the Forest-wide Standards and the management area prescriptions used in Alternative 5

Table B-26.
Rules for Assigning Management Areas by Order of Priority for Alternative 5 Maps and Acreages

Mgmt. Area	Description	CISC or GIS Data Layer and Codes
4D	Little Laurel RNA Map	LM_Areas = MA 1
8A	Existing Wilderness	LM_Areas = MA 2
6	Appalachian Trial	AT_Corr = T1
12	Water	Cisc ANAL_AREA = ' W__'
13	Lake Moomaw	LM_Areas = MA 11
20B	Utility Corridor/Back Creek	Cisc LNCL = 220 or LM_Areas = MA 12
20C	Communication Sites	Cisc LNCL = 240
1	Existing Wildlife Openings	Cisc LNCL = 250 and Fea_SP = Deer or Grouse
14A	Existing Wildlife Openings	Cisc LNCL = 250 and Fea_SP = Bear or Squirrel
15A	Existing Wildlife Openings	Cisc LNCL = 250 and Fea_SP = Turkey
1	Otherwise rest of Nonforest	Cisc ANAL_AREA = '_E0_' or '_EJ_'
4	Special Biological Niches	SBN layer = All
4	Big Schloss SMA	LM_Areas = MA 7
3A	Little River SMA	LM_Areas = MA 6
13	Crab Tr Falls & Mt Pleasant	LM_Areas = MA 19 or 20
10C	Jackson & North Rivers	WS_RVRS = JACKS or NORTH
10A	Scenic Wild and Scenic Rivers	WS_RVRS = "Scenic" Attribute
10B	Recreational Wild & Scenic Rr	WS_RVRS = "Recreational" Attrib
9	Skidmore & Dolly Ann SMA's	LM_Areas = MA 3
14A	Low Site Index land inside Southern Massanutten	LM_Areas = MA 04 AND (Cisc ANAL_AREA NOT LIKE '_G__' OR MGTY_SITE_CODE < 050 OR LNCL = 900)
17C	High Site Index land inside Southern Massanutten	LM_Areas = MA 04 AND Cisc MGTY_SITE_CODE >= 070
17E	Rest of Southern Mss. SMA	LM_Areas = MA 04
14A	Low Site Index land inside Hidden Valley & Laurel Fork	LM_Areas = (MA 05 or 09) AND (Cisc ANAL_AREA NOT LIKE '_G__' OR MGTY_SITE_CODE < 050 OR LNCL = 900)
17C	High Site Index land inside Hidden Valley & Laurel Fork	LM_Areas = (MA 05 or 09) AND Cisc MGTY_SITE_CODE >= 070
17E	Rest of Hidden Vly & Laurel Fk	LM_Areas = MA 05 or 09
1	Remaining Land	[Cisc ANAL_AREA LIKE ' F__' OR ' D__' OR MGTY_SITE_CODE < 050 OR LNCL = 900] AND Fea_Sp map layer = deer or grouse
15A	Same as above except Fea_SP = turkey	
14A	Same as above except Fea_SP = bear or squirrel	
17A	(Foreground and VQO retention from VQO map) AND MGTY_SITE_CODE >= 070	
17D	(Remaining foreground with a VQO retention from VQO map)	
17C	Remaining stands outside VQO areas Cisc MGTY_SITE_CODE >= 070	
17E	All remaining stands	

Constraints Associated With Alternative 5's Theme

In addition to the previously mentioned constraints that were common to alternatives, the following constraint sets were necessary to represent the theme of this alternative.

Constraint: Acreage allocation constraint by FORPLAN emphases, thus 712,558 acres of the tentatively suitable timberland base is available.

Table B-27.
Acreages Assigned to Management Emphases in Alternative 5

Emphases	Acreages
WSSUAM, MINLVL	2,780
WSREAM, MINLVL	9,468
TIMUAM, MINLVL	46,275
TIMEAM, TIMUAM, MINLVL	654,035
MINLVL	77,938
PRSREN	90,632
VIS	15,113
WLNESS	32,439
DEVREC	1,329
DISREC	11,360
RMT, RMTMVL	45,788
TKY, TKYMVL	69,999

Purpose: Limit the land available for various management activities.

Rationale. To model the theme of this alternative.

Constraint: Cannot allocate more than 5,000 acres to prescribed burning, of this total no more than 20% can be allocated to RMT

Purpose: To limit prescribed burning to no more than 500 acres annually.

Rationale. Assume this program is the same as current management

Constraint: Must harvest 68 MMBF in the first decade and not more than timber demand +50% for decades 2 to 5 (80, 86, 89, 89 MMBF/yr).

Purpose: To force timber management in the first decade.

Rationale Based on the theme of the alternative

Alternative 6

The ID Team prepared the planning paper *Alternative #6 For Consideration in the Revision of the Land and Resource Management Plan for the George Washington National Forest* to describe the overall purpose of the alternatives, the Forest-wide Standards and the management area prescriptions used in Alternative 6

Table B-28.
Rules for Assigning Management Areas by Order of Priority for Alternative 6 Maps and Acreages

Mgmt. Area	Description	CISC or GIS Data Layer and Codes
1A	Maps from Citizens Task Force	Alt6_Areas = 1A
2		Alt_AReas = 2
3A		Alt6_Areas = 3A
4A		Alt6_Areas = 4A
4C		Alt6_Areas = 4C
4D		Alt6_Areas = 4D
5A		Alt6_Areas = 5A
5B		Alt6_Areas = 5B
6		Alt6_Areas = 6
7A		Alt6_Areas = 7A
7B		Alt6_Areas = 7B
7C		Alt6_Areas = 7C
8A		Alt6_Areas = 8A
8B		Alt6_Areas = 8B
9		Alt6_Areas = 9
13		Alt6_Areas = 13
14		Alt6_Areas = 14
15		Alt6_Areas = 15
16		Alt6_Areas = 16
17		Alt6_Areas = 17
20B		Alt6_Areas = 20B

Constraints Associated With Alternative 6's Theme

In addition to the previously mentioned constraints that were common to alternatives, the following constraint sets were necessary to represent the theme of this alternative.

Constraint Acreage allocation constraint by FORPLAN emphases, thus 0 acres of the tentatively suitable timberland base is available.

Table B-29.
Acreages Assigned to Management Emphases in Alternative 6

Emphases	*Acreages*
MINLVL	152,749
PRSREN	298,052
VIS	6,487
WLNESS	123,082
MOTMVL	9,163
DEVREC	1,329
DISREC	8,847
RMT, RMTMVL	117,455
TKY, TKYMVL	339,992

Purpose. Limit the land available for various management activities.

Rationale· To model the theme of this alternative

Constraint· Cannot allocate more than 30,000 acres to prescribed burning, of this total no more than 20% can be allocated to RMT.

Purpose To insure as large a wildlife program is feasible

Rationale· Based on the theme of the alternative

Constraint· Must produce at least 46,194 wuds for bear, 97,086 wuds for turkey and 180,907 WUDs for deer

Purpose To produce as least the same amount of bear, deer and turkey WUD's as Alternative 8a

Rationale· To see how many acres of prescribed burning and wildlife clearings are necessary to produce the same wildlife objectives as Alternative 8a and what are the costs and benefits of doing so?

Constraint. No prescriptions which allow scheduled timber harvest can occur in this alternative

Purpose. To allow no timber harvest to occur

Rationale· The reason being only a very small amount of land is considered above benefit

Alternative 7

The ID Team prepared the planning paper *Alternative #7 For Consideration in the Revision of the Land and Resource Management Plan for the George Washington National Forest* to describe the overall purpose of the alternatives, the Forest-wide Standards and the management area prescriptions used in Alternative 7

Table B-30
Rules for Assigning Management Areas by Order of Priority for Alternative 7 Maps and Acreages

Mgmt. Area	Description	CISC or GIS Data Layer and Codes
4D	Little Laurel RNA Map	LM_Areas = MA 1
8A	Existing Wilderness	LM_Areas = MA 2
6	Appalachian Trail	AT_Corr = T1
12	Water	Cisc ANAL_AREA = ' W__'
13	Lake Moomaw	LM_Areas = MA 11
20B	Utility Corridor/Back Creek	Cisc LNCL = 220 or LM_Areas = MA 12
20C	Communication Sites	Cisc LNCL = 240
1	Existing Wildlife Openings	Cisc LNCL = 250 and VDGIF_Areas = Deer or Grouse
14A	Existing Wildlife Openings	Cisc LNCL = 250 and VDGIF_Areas = Bear or Squirrel
15A	Existing Wildlife Openings	Cisc LNCL = 250 and VDGIF_Areas = Turkey
1	Otherwise rest of Nonforest	Cisc ANAL_AREA = '_E0_' or '_EJ_'
4	Special Biological Niches	SBN layer = All
13	Crab Tr Falls & Mt Pleasant	LM_Areas = MA 19 or 20
10A	Scenic Wild and Scenic Rivers	WS_RVRS = "Scenic" Attribute
10B	Recreational Wild & Scenic Rr	WS_RVRS = "Recreational" Attrib.
14A	Low Sites within 12 Roadless Areas*	[12 RDLS_Areas AND (Cisc ANAL_AREA NOT LIKE '_G__' OR MGTY_SITE_CODE <= 040 OR LNCL = 900)]
14B	Remaining Retention VQO within 12 Roadless Areas*	[12 RDLS_AREAS AND (VQO retention from VQO map)
14D	Remaining area within 12 Roadless Areas*	12 RDLS_AREAS
14A	Low Productivity Land within Wildlife Habitat Situation 1	VDGIF_AREAS = 14 AND (ANAL_AREA NOT LIKE '_G__' OR MGTY_SITE_CODE <= 040 OR LNCL = 900)
14B	Remaining Wildlife Habitat Sit 1 within Retention VQO areas	VDGIF_AREAS = 14 AND (VQO retention from VQO map)
14D	Remaining Wildlife Situation 1	VDGIF_AREAS = 14
15A	Low Productivity Land within Wildlife Habitat Situation 2	VDGIF_AREAS = 15 AND (ANAL_AREA NOT LIKE '_G__' OR MGTY_SITE_CODE <= 040 OR LNCL = 900)
15B	Remaining Wildlife Habitat Sit 2 within Retention VQO areas	VDGIF_AREAS = 15 AND (VQO retention from VQO map)
15D	Remaining Wildlife Situation 2	VDGIF_AREAS = 15
1	Low Productivity Land within Wildlife Habitat Situation 3	VDGIF_AREAS = 16 AND (ANAL_AREA NOT LIKE '_G__' OR MGTY_SITE_CODE <= 040 OR LNCL = 900)
16	Remaining Wildlife Habitat Sit. 3 within Retention VQO areas	VDGIF_AREAS = 16 AND (VQO retention from VQO map)
16B	Remaining Wildlife Situation 3	VDGIF_AREAS = 16
1	All remaining stands	

* Twelve roadless areas in this alternative are. Adams Peak, Dolly Anne, Dry River, Elliot Knob, Northern Massanutten, Rough Mountain Addition, Southern Massanutten, St Marys Addition, The Friars, The Priest, Three Ridges, and Three Sisters.

Constraints Associated With Alternative 7's Theme

In addition to the previously mentioned constraints that were common to alternatives, the following constraint sets were necessary to represent the theme of this alternative.

Constraint. Acreage allocation constraint by FORPLAN emphases, thus 778,753 acres of the tentatively suitable timberland base is available

Table B-31.
Acreages Assigned to Management Emphases In Alternative 7

Emphases	Acreages
VISUAM, MINLVL	8,213
WSSUAM, MINLVL	5,721
WSREAM, MINLVL	8,792
RMTUAM, RMT, RMTMVL	12,562
RMTEAM, RMTUAM, RMT, RMTMVL	128,389
TKYUAM, TKY, TKYMVL	34,967
TKYEAM, TKYUAM, TKY, TKYMVL	433,740
BWSTIM, MINLVL	146,369
MINLVL	81,177
PRSREN	73,835
VIS	15,113
WLNESS	32,439
DEVREC	1,329
DISREC	11,360
RMT, RMTMVL	28,175
TKY, TKYMVL	34,975

Purpose: Limit the land available for various management activities

Rationale. To model the theme of this alternative.

Constraint: Cannot allocate more than 30,000 acres to prescribed burning, of this total no more than 20% can be allocated to RMT.

Purpose· To do as much prescribed burning as possible

Rationale: Theme of the alternative is to maximize big game WUDs.

Constraint. No more than 20% of the volume in decade 1 can be by uneven-aged management

Purpose: To limit uneven-aged management to no more than 20%

Rationale· Based on the theme of the alternative.

Constraint: Must produce at least 45,991 bear wuds/year, 250,161 deer wuds/year; and 118,532 turkey wuds per year in the first decade Estimates based on max wildlife run

Purpose To maximize as many big game WUDs as possible

Rationale: Based on the theme of the alternative

Alternative 8

The ID Team prepared the planning paper *Alternative #8 For Consideration in the Revision of the Land and Resource Management Plan for the George Washington National Forest* to describe the overall purpose of the alternatives, the Forest-wide Standards and the management area prescriptions used in Alternative 8

Table B-32.
Rules for Assigning Management Areas by Order of Priority for Alternative 8 Maps and Acreages

Mgmt. Area	Description	CISC or GIS Data Layer and Codes
4D	Little Laurel RNA Map	LM_Areas = MA 1
8A	Existing Wilderness	LM_Areas = MA 2
8B	3 modified Roadless Areas of Priest, Three Ridges, & St Mary's Addition	Alt14_Areas = MA 8B
4A	Special Biological Niches	SBN layer = All
4C	Geologic Areas	Alt6_Areas = 4C
6	Appalachian Trial	AT_Corr = T1
12	Water	Cisc ANAL_AREA = ' W__'
13A	Lake Moomaw	LM_Areas = MA 11
20B	Utility Corridor/Back Creek	Cisc LNCL = 220 or LM_Areas = MA 12
20C	Communication Sites	Cisc LNCL = 240
1	Existing Wildlife Openings	Cisc LNCL = 250 and Bobs_Areas = Deer or Grouse
14A	Existing Wildlife Openings	Cisc LNCL = 250 and Bobs_Areas = Bear or Squirrel
15A	Existing Wildlife Openings	Cisc LNCL = 250 and Bobs_Areas = Turkey
1	Otherwise rest of Nonforest	Cisc ANAL_AREA = '_E0_' or '_EJ_'
13A	Crab Tr Falls	LM_Areas = MA 19
13A	Mt. Pleasant Roadless Area	RDLS_AREAS = MTPLE
10C	Jackson & North Rivers	WS_RVRS = JACKS or NORTH
10A	Scenic Wild and Scenic Rivers	WS_RVRS = "Scenic" Attribute
10B	Recreational Wild & Scenic Rr	WS_RVRS = "Recreational" Attrib
9	All Remaining Roadless Areas	RDLS_Areas = All Remaining
1A	Remaining Land in Laurel Fork	LM_Areas = MA 05
13A	Heavy Dispersed Rec Areas	Bobs_Areas" layer = 13
11B	Medium Site Index Land within Retention or Partial Retention VQO areas inside Four ATV areas*	["ATV_Areas" AND (VQO Layer = Retention or Partial Retention) AND "Cisc" MGTY_SITE_CODE >= 050]
11C	Remaining Medium Site Index land inside Four ATV areas*	["ATV_Areas" AND "Cisc_GW" MGTY_SITE_CODE >= 050]
11A	Remaining Low Site Index Land inside Four ATV areas*	"ATV_Areas"
7	Certain Sensitive Road Corridors	Alt6_Areas or Alt14_Areas = 07

Mgmt. Area	Description	CISC or GIS Data Layer and Codes
17A	High Site Index Land within Retention or Partial Retention VQO Areas	["Bobs_Areas" Coverage = 17 AND (VQO Layer = Retention or Partial Retention) AND "Cisc_GW" MGTY_SITE_CODE >= 070]
17D	Medium Site Index Land within Retention or Partial Retention VQO Areas	["Bobs_Areas" Coverage = 17 AND (VQO Layer = Retention or Partial Retention) AND "Cisc_GW" MGTY_SITE_CODE >= 050]
17B	Remaining High Site Index Land	["Bobs_Areas" Coverage = 17 AND "Cisc_GW" MGTY_SITE_CODE >= 070]
17E	Remaining Medium Site Index Land	["Bobs_Areas" Coverage = 17 AND "Cisc_GW" MGTY_SITE_CODE >= 050]
1A	Remaining Low Site Index Land	"Bobs_Areas" Coverage = 17
14B	Medium or Higher Site Index Land within Wildlife Habitat Sit 1 within Retention or Partial Retention VQ0 areas	["Bobs_Areas" Coverage = 14 AND (VQO Layer = Retention or Partial Retention) AND "Cisc_GW" MGTY_SITE_CODE >= 050]
14D	Remaining Medium or Higher Site Index Land within Wildlife Habitat Sit 1	["Bobs_Areas" Coverage = 14 AND "Cisc_GW" MGTY_SITE_CODE >= 050]
14A	Remaining Low Site Index Land Within Wildlife Habitat Sit. 1	"Bobs_Areas" Coverage = 14
15B	Medium or Higher Site Index Land within Wildlife Habitat Sit 2 within Retention or Partial Retention VQ0 areas	["Bobs_Areas" Coverage = 15 AND (VQO Layer = Retention or Partial Retention) AND "Cisc_GW" MGTY_SITE_CODE >= 050]
15D	Remaining Medium or Higher Site Index Land within Wildlife Habitat Sit. 2	["Bobs_Areas" Coverage = 15 AND "Cisc_GW" MGTY_SITE_CODE >= 050]
15A	Remaining Low Site Index Land Within Wildlife Habitat Sit 2	"Bobs_Areas" Coverage = 15
16B	Medium or Higher Site Index Land within Wildlife Habitat Sit 3 within Retention or Partial Retention VQ0 areas	["Bobs_Areas" Coverage = 16 AND (VQO Layer = Retention or Partial Retention) AND "Cisc_GW" MGTY_SITE_CODE >= 050]
16A	Remaining Medium or Higher Site Index Land within Wildlife Habitat Sit. 3	["Bobs_Areas" Coverage = 16 AND "Cisc_GW" MGTY_SITE_CODE >= 050]
1A	Remaining Low Site Index Land Within Wildlife Habitat Sit 3	"Bobs_Areas" Coverage = 16
1A	*All remaining stands*	

• Four ATV areas, some of which have the boundaries modified, in this alternative are· Archer Area on the Deerfield Ranger District, Brushy Mountain on the James River Ranger District, Rocky Run on the Dry River Ranger District, South Pedlar on the Pedlar Ranger District, and Taskers Gap on the Lee Ranger District.

Constraints Associated With Alternative 8's Theme

In addition to the previously mentioned constraints that were common to alternatives, the following constraint sets were necessary to represent the theme of this alternative

Constraint Acreage allocation constraint by FORPLAN emphases, thus 450,054 acres of the tentatively suitable timberland base is available

Table B-33.
Acreages Assigned to Management Emphases in Alternative 8

Emphases	Acreages
VISUAM, MINLVL	5,574
WSSUAM, MINLVL	2,780
WSREAM, MINLVL	9,429
MOTUAM, MOTMVL	2,283
MOTEAM, MOTUAM, MOTMVL	4,990
RMTUAM, RMT, RMTMVL	18,806
RMTEAM, RMTUAM, RMT, RMTMVL	47,502
TKYUAM, TKY, TKYMVL	73,583
TKYEAM, TKYUAM, TKY, TKYMVL	167,434
BWSTIM, MINLVL	23,239
TIMUAM, MINLVL	33,217
TIMEAM, TIMUAM, MINLVL	61,217
MINLVL	165,572
PRSREN	299,535
VIS	10,707
WLNESS	43,938
MOTMVL	2,393
DEVREC	1,329
DISREC	16,508
RMT, RMTMVL	24,009
TKY, TKYMVL	43,111

Purpose· Limit the land available for various management activities

Rationale· To model the theme of this alternative

Constraint· Cannot allocate more than 30,000 acres to prescribed burning and 4,000 acres to wildlife clearings; of this total no more than 20% can be allocated to RMT

Purpose: To limit prescribed burning to no more than 30,000 acres and wildlife clearings to 4,000 acres.

Rationale: Based on the theme of the alternative.

Constraint· Clearcutting only allowed within management areas 16 and 17.

Purpose: To limit clearcutting to only management areas where intensive timber management will be applied.

Rationale: Based on the theme of the alternative.

Constraint. Cannot clearcut or seed tree more than 700 acres in decade 1

Purpose: To limit clearcutting to no more than 300 acres and seed tree to no more than 400 acres.

Rationale· Based on the theme of the alternative.

Constraint. Must allocate all management areas defined suitable for uneven-aged management in Alternative 8 to uneven-aged.

Purpose: To apply as much uneven-aged management as possible on lands that are suitable for this cutting system

Rationale. Based on the theme of the alternative.

Constraint. *Maximize projected net revenue.*

Purpose To obtain as positive projected net revenue as possible subject to the other constraints.

Rationale: To harvest the timber as economically as possible to address the issue of below cost timber sales.

Constraint Suitable land base defined as follows.
1) Cove hardwoods
2) White Pine
3) Upland hardwoods, Site Index 60 or better
4) All plantations

Purpose. To define enough suitable acres to ensure the ASQ can be implemented and base the criteria on the most economically efficient timberlands

Rationale: To address issue of below cost timber sales.

Constraint: Must harvest 27 MMBF in the first decade.

Purpose: To harvest 27 MMBF in the first decade

Rationale. The level of economical timber harvest that can be achieved while emphasizing biological values -- proposed, threatened, endangered, and sensitive species, large areas of unfragmented habitat for area-sensitive species and wildlife viewing and nature studies.

Alternative 8A

The ID Team prepared the planning paper *Alternative #8A For Consideration in the Revision of the Land and Resource Management Plan for the George Washington National Forest* to describe the overall purpose of the alternatives, the Forest-wide Standards and the management area prescriptions used in Alternative 8A

Table B-34.
Rules for Assigning Management Areas by Order of Priority for Alternative 8A Maps and Acreages

Mgmt. Area	Description	CISC or GIS Data Layer and Codes
4A	Maps from Alternative 8, 14 and public comments	Alt8A_Areas = 4A
4C		Alt8A_Areas = 4C
4D		Alt8A_Areas = 4D
4E		Alt8A_Areas = 4E
5B		Alt8A_Areas = 5B
6		Alt8A_Areas = 6
7A		Alt8A_Areas = 7A
7B		Alt8A_Areas = 7B
7C		Alt8A_Areas = 7C
7D		Alt8A_Areas = 7D
7E		Alt8A_Areas = 7E
7X		Alt8A_Areas = 7X
8A		Alt8A_Areas = 8A
8B		Alt8A_Areas = 8B
9B		Alt8A_Areas = 9B
10A		Alt8A_Areas = 10A
10B		Alt8A_Areas = 10B
10C		Alt8A_Areas = 10C
11A		Alt8A_Areas = 11A
11B		Alt8A_Areas = 11B
11C		Alt8A_Areas = 11C
13A		Alt8A_Areas = 13A
13B		Alt8A_Areas = 13B
13C		Alt8A_Areas = 13C
14A		Alt8A_Areas = 14A
14C		Alt8A_Areas = 14C
15A		Alt8A_Areas = 15A
15B		Alt8A_Areas = 15B
15C		Alt8A_Areas = 15C
16D		Alt8A_Areas = 16D
16E		Alt8A_Areas = 16E
17B		Alt8A_Areas = 17B
17F		Alt8A_Areas = 17F
17X		Alt8A_Areas = 17X
20		Alt8A_Areas = 20
21		Alt8A_Areas = 21
22		Alt8A_Areas = 22

Constraints Associated With Alternative 8A's Theme

In addition to the previously mentioned constraints that were common to alternatives, the following constraint sets were necessary to represent the theme of this alternative

Constraint: Acreage allocation constraint by FORPLAN emphases, thus 465,854 acres of the tentatively suitable timberland base is available

Table B-35.
Acreages Assigned to Management Emphases in Alternative 8A

Emphases	Acreages
VISERM, VISMVL	7,991
VISEAM, VISMVL	6,539
VISUAM, VISMVL	284
WSSUAM, WSSMVL	103
WSREAM, WSSMVL	719
MOTUAM, MOTMVL	2,216
MOTEAM, MOTMVL	2,560
DISTIM, DISMVL	5,180
RMTEAM, RMT, RMTMVL	68,217
TKYUAM, TKY, TKYMVL	6,385
TKYEAM, TKY, TKYMVL	245,945
BWSTIM, BWSMVL	37,032
TIMUAM, TIMMVL	2,843
TIMEAM, TIMMVL	79,840
MINLVL	23,273
PRSREN	83,677
VIS	8,245
VISMVL	29,384
WLNESS	43,499
PRSMVL	141,259
WSSMVL	9,174
MOTMVL	6,486
DEVREC	1,329
DISREC	20,586
DISMVL	12,578
RMT	62,365
TKY	78,856
BWSMVL	2,210
TIMMVL	7,077
SMAMVL	59,527
WLDMVL	5,702

Purpose: Limit the land available for various management activities.

Rationale. To model the theme of this alternative.

Constraint: Cannot allocate more than 30,000 acres to prescribed burning and 4,000 acres to wildlife clearings, of this total no more than 20% can be allocated to RMT

Purpose To limit prescribed burning to no more than 30,000 acres and wildlife clearings to 4,000 acres

Rationale Based on the theme of the alternative

Constraint. Clearcutting only allowed within management areas 16 and 25% of 17.

Purpose To limit clearcutting to only management areas where intensive timber management will be applied

Rationale Based on the theme of the alternative

Constraint Cannot clearcut or seed tree more than 700 acres in decade 1.

Purpose· To limit clearcutting to no more than 300 acres and seed tree to no more than 400 acres

Rationale. Based on the theme of the alternative.

Constraint· Maximize projected net revenue

Purpose. To obtain as positive projected net revenue as possible subject to the other constraints

Rationale. To harvest the timber as economically as possible to address the issue of below cost timber sales

Constraint. Suitable land base defined as follows·
1) Cove hardwoods
2) White Pine
3) Upland hardwoods, Site Index 60 or better
4) Upland hardwoods, Site Index 50, Roaded Natural and Semiprimitive Motorized, and <55% slope
5) All plantations

Purpose To define enough suitable acres to ensure the ASQ can be implemented and base the criteria on the most economically efficient timberlands

Rationale· To address issue of below cost timber sales.

Constraint· Must harvest 33 MMBF in the first decade.

Purpose· To harvest 33 MMBF in the first decade.

Rationale. Response to public comments on the DEIS which wanted a timber program that accomplishes the following·
1) Harvest timber as economically efficiently as possible
2) Minimize, as much as possible, income and employment effects within local communities.
3) Provide an increase in wildlife habitat manipulation from the present program
4) The salvage program related to Gypsy Moth mortality should occur on suitable lands

Alternative 9

The ID Team prepared the planning paper *Alternative #9 For Consideration in the Revision of the Land and Resource Management Plan for the George Washington National Forest* to describe the overall purpose of the alternatives, the Forest-wide Standards and the management area prescriptions used in Alternative 9.

Table B-36.
Rules for Assigning Management Areas by Order of Priority for Alternative 9 Maps and Acreages

Mgmt. Area	Description	CISC or GIS Data Layer and Codes
1A	Maps from Wilderness Advocates	Alt9_Areas = 1A
2A		Alt9_Areas = 2
3A		Alt9_Areas = 3A
4A		Alt9_Areas = 4A
4C		Alt9_Areas = 4C
4D		Alt9_Areas = 4D
5A		Alt9_Areas = 5A
5B		Alt9_Areas = 5B
6		Alt9_Areas = 6
8A		Alt9_Areas = 8A
8B		Alt9_Areas = 8B
9		Alt9_Areas = 9
10C		Alt9_Areas = 10C
13A		Alt9_Areas = 13
14A		Alt9_Areas = 14A
14B		Alt9_Areas = 14B
15A		Alt9_Areas = 15A
15B		Alt9_Areas = 15B
17A		Alt9_Areas = 17A
17D		Alt9_Areas = 17D
20B		Alt9_Areas = 20B
1A	Any Remaining Stands	

Constraints Associated With Alternative 9's Theme

In addition to the previously mentioned constraints that were common to alternatives, the following constraint sets were necessary to represent the theme of this alternative.

Constraint Acreage allocation constraint by FORPLAN emphases, thus 70,117 acres of the tentatively suitable timberland base is available

Table B-37.
Acreages Assigned to Management Emphases in Alternative 9

Emphases	Acreages
RMTUAM, RMT, RMTMVL	13,717
TKYUAM, TKY, TKYMVL	43,251
TIMUAM, MINLVL	13,149
MINLVL	32,088
PRSREN	523,000
VIS	5,691
WLNESS	274,794
DEVREC	1,329
DISREC	8,967
RMT, RMTMVL	16,094
TKY, TKYMVL	104,415
WSSMVL	7,969
TIMMVL	16,616

Purpose· Limit the land available for various management activities.

Rationale To model the theme of this alternative

Constraint Cannot allocate more than 5,000 acres to prescribed burning; of this total no more than 20% can be allocated to RMT

Purpose· To limit prescribed burning to no more than 500 acres annually

Rationale· Assume the program is the same as current management.

Constraint. Maximize timber.

Purpose. To harvest as much timber as possible from the small land base

Rationale· Based on the theme of the alternative.

Constraint Only uneven-aged management is applied

Purpose To only apply uneven-aged management

Rationale Based on the theme of the alternative

Alternative 10

The ID Team prepared the planning paper *Alternative #10 for Consideration in the Revision of the Land and Resource Management Plan for the George Washington National Forest* to describe the overall purpose of the alternatives, the Forest-wide Standards and the management area prescriptions used in Alternative 10

Table B-38.
Rules for Assigning Management Areas by Order of Priority for Alternative 10 Maps and Acreages

Mgmt. Area	Description	CISC or GIS Data Layer and Codes
4D	Little Laurel RNA Map	LM_Areas = MA 1
8A	Existing Wilderness	LM_Areas = MA 2
8B	St Mary's and Rough Mt Roadless Areas	RDLS_Areas = SMREX or RMTEX
6	*Appalachian Trial*	*AT_Corr = T1*
12	Water	Cisc ANAL_AREA = ' W__'
13A	Lake Moomaw	LM_Areas = MA 11
20B	Utility Corridor/Back Creek	Cisc LNCL = 220 or LM_Areas = MA 12
20C	Communication Sites	Cisc LNCL = 240
1	Existing Wildlife Openings	Cisc LNCL = 250 and Fea_Sp = Deer or Grouse
14A	Existing Wildlife Openings	Cisc LNCL = 250 and Fea_Sp = Bear or Squirrel
15A	Existing Wildlife Openings	Cisc LNCL = 250 and Fea_Sp = Turkey
1	Otherwise rest of Nonforest	Cisc ANAL_AREA = '_E0_' or '_EJ_'
4A	Special Biological Niches	SBN layer = All
10C	Wild and Scenic Rivers	W/S layer = All
13A	Crab Tr Falls	LM_Areas = MA 19
17B	Areas With High Concentration of High Quality Timber (Positive PNV's)	"Timb10_Only" Coverage AND "Cisc_GW" MGTY_SITE_CODE >= 060
1	Remaining Medium to Low Site Index Stands inside above Area	"Timb10_Only" = All
3A	Little River Roadless Area	RDLS_AREAS = LRIVR
9	Dolly Anne SMA	LM_Areas = 03
5A	Six Roadless Areas*	RDLS_Areas = MTPLE, FRIAR, PREST, THRID, SMASS, or NMASS
14A	Any land within Current Bear or Squirrel Featured Species Areas	Feat_Sp = Bear or Squirrel
15A	Any land within Current Turkey Featured Species Areas	Feat_Sp = Turkey
1A	Any land within Current Deer or Grouse Featured Species Areas	Feat_Sp = Deer or Grouse
1A	Any remaining stands	

* Six roadless areas assigned to Management Area 5 in this alternative are Mount Pleasant, Northern Massanutten, Southern Massanutten, The Friars, The Priest and Three Ridges.

Constraints Associated With Alternative 10's Theme

In addition to the previously mentioned constraints that were common to alternatives, the following constraint sets were necessary to represent the theme of this alternative.

Constraint: Acreage allocation constraint by FORPLAN emphases, thus 120,295 acres of the tentatively suitable timberland base is available.

Table B-39.
Acreages Assigned to Management Emphases in Alternative 10

Emphases	Acreages
TIMEAM, TIMUAM, MINLVL	120,295
MINLVL	317,108
PRSREN	136,480
VIS	15,113
WLNESS	34,857
DEVREC	1,329
DISREC	5,515
RMT, RMTMVL	157,026
TKY, TKYMVL	269,433

Purpose: Limit the land available for various management activities

Rationale. To model the theme of this alternative

Constraint Cannot allocate more than 30,000 acres to prescribed burning; of this total no more than 20% can be allocated to RMT

Purpose To obtain as many benefits from big game WUDs as economically efficient as possible

Rationale To obtain as many benefits from big game WUDs as economically efficient as possible

Constraint. Must harvest 15 MMBF in the first decade

Purpose: To constrain the model to 15 MMBF in the first decade

Rationale: Based on results from a FORPLAN run that maximized PNV based on timber variable costs and benefits This run harvested 19 MMBF in the first decade 15 MMbf was chosen to obtain the most value for the lowest overhead and assessment costs

Alternative 11

The ID Team prepared the planning paper *Alternative #11 for Consideration in the Revision of the Land and Resource Management Plan for the George Washington National Forest* to describe the overall purpose of the alternatives, the Forest-wide Standards and the management area prescriptions used in Alternative 11

Table B-40
Rules for Assigning Management Areas by Order of Priority for Alternative 11 Maps and Acreages

Mgmt. Area	Description	CISC or GIS Data Layer and Codes
4D	Little Laurel RNA Map	LM_Areas = MA 1
8A	Existing Wilderness	LM_Areas = MA 2
8B	Twelve Roadless Areas*	RDLS_Areas ="RMTEX" "PREST" "LAURL" "SMREX" "MTPLE" "DRIVR" "RAMEX" "JERKM" "KELLY" "THRID" "ELIOT" "SMASS"
8B	Boundary Adjusted Little River Roadless Area	MODRDLS_AREAS = 11LRIVR
6	Appalachian Trial	AT_Corr = T1
12	Water	Cisc ANAL_AREA = ' W__'
20B	Utility Corridor/Back Creek	Cisc LNCL = 220 or LM_Areas = MA 12
20C	Communication Sites	Cisc LNCL = 240
1	Existing Wildlife Openings	Cisc LNCL = 250
13A	Lake Moomaw	LM_Areas = MA 11
5A	Hidden Valley & Jackson River	LM_Areas = MA 9 or 17
5A	Crab Tr. Falls	LM_Areas = MA 19
4A	Special Biological Niches	SBN layer = All
4A	Dolly Anne SMA	LM_Areas = 3
5A	Big Schloss SMA	LM_Areas = 7
5A	Northern Mass, Mt. Crawford, Skidmore, & Three Sisters Roadless Areas	RDLS_Areas ="NMASS" "CRFWD" "SISTR" "SKIDM"
11A	Oak Knob and Gum Run Roadless Areas	RDLS_Areas ="GUMRN" "OAKKB"
9	Beard Mt and Mill Mt Roadless Areas	RDLS_Areas ="BEARD" "MILLM"
9	Any Remaining Land in Laurel Fork SMA	LM_Areas = 5
10A	Scenic Wild and Scenic Rivers	WS_RVRS = "Scenic" Attribute
10B	Recreational Wild & Scenic Rr	WS_RVRS = "Recreational" Attrib
14D	Little Alleghany, Adams Peak, and The Friars Roadless Areas	[RDLS_AREAS Coverage = "LITMT, ADAMS, OR FRIAR" AND "Cisc_GW" MGTY_SITE_CODE >= 040]
14A	Any Remaining Land in Little Alleghany, Adams Peak, and The Friars Roadless Areas	RDLS_AREAS Coverage = "LITMT, ADAMS, OR FRIAR"
11B	Tentatively Suitable Timberland within Taskers Gap, North Pedlar, and South Pedlar ATV Areas	(ATV_AREAS = TASKG, NTPED, or STPED) and "Cisc_GW" MGTY_SITE_CODE >= 040 (Note. 11B is proxy, model will allow use of either 11B or 11C)
11A	Any unproductive land inside above ATV areas	ATV_AREAS = TASKG, NTPED, or STPED
7A	Tentatively Suitable Timberland within Sensitive Road Corridors	(ALL Retention VQO's from VQO Map) 'ND "Cisc_GW" MGTY_SITE_CODE >= 040
7B	Tentatively Suitable Timberland within Other Road Corridors	(ALL Partial Retention VQO's from VQO Map) AND "Cisc_GW" MGTY_SITE_CODE >= 040

* Twelve roadless areas recommended for wilderness study in this alternative are Dry River, Elliott Knob, Jerkemtight, Kelley Mountain, Laurel Fork, Mount Pleasant, Ramseys Draft Addition, Rough Mountain Addition, Southern Massanutten, St Marys Addition, Three Ridges and The Priest

Mgmt. Area	Description	CISC or GIS Data Layer and Codes
14D	Featured Species / High Quality Timber Areas	FEAT_SP =(Bear or Squirrel) AND 'Cisc_GW' MGTY_SITE_CODE >= 040 AND 'TIMBER12' coverage
14A	Remaining Unproductive land within Featured Species / High Quality Timber Areas	FEAT_SP =(Bear or Squirrel) AND 'TIMBER12' coverage
15D	Featured Species / High Quality Timber Areas	FEAT_SP =Turkey AND 'Cisc_GW' MGTY_SITE_CODE >= 040 AND 'TIMBER12' coverage
15A	Remaining Unproductive land within Featured Species / High Quality Timber Areas	FEAT_SP =Turkey AND 'TIMBER12' coverage
16B	Featured Species / High Quality Timber Areas	FEAT_SP =(Deer or Grouse) AND 'Cisc_GW' MGTY_SITE_CODE >= 040 AND 'TIMBER12' coverage
1A	Remaining Unproductive land within Featured Species / High Quality Timber Areas	FEAT_SP =(Deer or Grouse) AND 'TIMBER12' coverage
1A	All remaining stands	

* These rules were modified based on specific public comments in the DEIS. The public comments and responses can be found in Appendix I of this document

Constraints Associated With Alternative 11's Theme

In addition to the previously mentioned constraints that were common to alternatives, the following constraint sets were necessary to represent the theme of this alternative

Constraint Acreage allocation constraint by FORPLAN emphases, thus 363,909 acres of the tentatively suitable timberland base is available

Table B-41.
Acreages Assigned to Management Emphases in Alternative 11

Emphases	Acreages
VISUAM, VISMVL	20,381
VISEAM, VISMVL	25,191
WSSUAM, WSSMVL	1,912
WSREAM, WSSMVL	4,414
DISTIM, DISMVL	11,564
RMTEAM, RMT, RMTMVL	45,131
RMTUAM, RMT, RMTMVL	11,110
TKYEAM, TKY, TKYMVL	152,955
TKYUAM, TKY, TKYMVL	91,251
MINLVL	33,787
PRSREN	217,761
VIS	8,155
WLNESS	143,077
DEVREC	1,329
RMT, RMTMVL	133,940
TKY, TKYMVL	57,580
VISMVL	50,247
WSSMVL	7,236
DISREC	19,008
DISMVL	25,052

Purpose: Limit the land available for various management activities

Rationale. To model the theme of this alternative.

Constraint: Cannot allocate more than 5,000 acres to prescribed burning, of this total no more than 20% can be allocated to RMT.

Purpose. To limit prescribed burning to no more than 500 acres annually.

Rationale. Assume the program is the same as current management

Constraint Only temporary roads can be built to access suitable timber acres

Purpose: No building of system roads is allowed in this alternative

Rationale: Based on the theme of this alternative

Constraint: No timber harvest can occur in SPM and SPNM lands

Purpose. Based on the theme of this alternative.

Rationale: Based on the theme of this alternative.

Constraint No clearcutting can occur.

Purpose No clearcutting

Rationale: Based on the theme of the alternative.

Constraint. Must harvest 21 MMBF/yr in decade 1

Purpose. The max timber run can harvest about 33 MMBF/yr with a projected net revenue of -1000 M$ in decade 1 Max PNV run harvested about 17 MMBF/yr with a projected net revenue of -$450 M$. This alternative was developed to harvest 21 MMBF/yr with as positive projected net revenue as possible. When the volume increased by 4 MMBF projected net revenue only decreased by 61 M$

Rationale: Based on the theme of this alternative

Alternative 12

The ID Team prepared the planning paper *Alternative #12 for Consideration in the Revision of the Land and Resource Management Plan for the George Washington National Forest* to describe the overall purpose of the alternatives, the Forest-wide Standards and the management area prescriptions used in Alternative 12.

Table B-42.
Rules for Assigning Management Areas by Order of Priority for Alternative 12 Maps and Acreages

Mgmt. Area	Description	CISC or GIS Data Layer and Codes
4D	Little Laurel RNA Map	LM_Areas = MA 1
8A	Existing Wilderness	LM_Areas = MA 2
6	Appalachian Trial	AT_Corr = T1
12	Water	Cisc ANAL_AREA = ' W__'
13A	Lake Moomaw	LM_Areas = MA 11
20B	Utility Corridor/Back Creek	Cisc LNCL = 220 or LM_Areas = MA 12
20C	Communication Sites	Cisc LNCL = 240
1	Existing Wildlife Openings	Cisc LNCL = 250 and VDGIF_Areas = Deer or Grouse
14A	Existing Wildlife Openings	Cisc LNCL = 250 and VDGIF_Areas = Bear or Squirrel
15A	Existing Wildlife Openings	Cisc LNCL = 250 and VDGIF_Areas = Turkey
1	Otherwise rest of Nonforest Cisc ANAL_AREA = '_E0_' or '_EJ_'	
4A	Special Biological Niches	SBN layer = All

Mgmt. Area	Description	CISC or GIS Data Layer and Codes
9	Big Schloss SMA	LM_Areas = 7
3A	Little River SMA	LM_Areas = 6
13	Crab Tr Falls,Mt Pl SMA's	LM_Areas = MA 19 or 20
10C	Jackson & North Rivers	WS_RVRS = JACKS or NORTH
10A	Scenic Wild and Scenic Rivers	WS_RVRS = "Scenic" Attribute
10B	Recreational Wild & Scenic Rr	WS_RVRS = "Recreational" Attrib
9	Skidmore and Dolly Anne SMAs	LM_Areas = 3
11B	Medium Site Index Land within Retention VQO areas within Nine ATV Areas*	[Nine "ATV_AREAS" Coverage AND (VQO Layer = Retention) AND "Cisc_GW" MGTY_SITE_CODE >= 050]
11C	Remaining Medium Site Index land inside Nine ATV areas*	["ATV_Areas" AND "Cisc_GW" MGTY_SITE_CODE >= 050]
11A	Remaining Low Site Index Land inside Nine ATV areas*	"ATV_Areas"
17A	High Site Index Land within Retention VQO Areas	["Timb10_Only" Coverage = 17 AND (VQO Layer = Retention) AND "Cisc_GW" MGTY_SITE_CODE >= 070]
17D	Medium Site Index Land within Retention VQO Areas	["Timb10_Only" Coverage = 17 AND (VQ0 Layer = Retention) AND "Cisc_GW" MGTY_SITE_CODE >= 050]
17B	Remaining High Site Index Land	"Timb10_Only" Coverage = 17 AND "Cisc_GW" MGTY_SITE_CODE >= 070
17E	Remaining Medium Site Index Land	"Timb10_Only" Coverage = 17 AND "Cisc_GW" MGTY_SITE_CODE >= 050
1	Remaining Low Site Index Land	"Tim10_Only" Coverage = 17
14A	Wildlife Habitat Situation 1 within SPNM Areas	VDGIF_AREAS = 14 AND (ROS = SPNM)]
15A	Wildlife Habitat Situation 2 within SPNM Areas	[(VDGIF_AREA = 15) AND (ROS = SPNM)]
14D	Medium Site Index Land Remaining in Wildlife Habitat Sit 1	[VDGIF_AREA = 14 AND "Cisc_GW" MGTY_SITE_CODE >= 050]
14A	Remaining Low Site Index Land in Wildlife Habitat Situation 1	VDGIF_AREA = 14
15D	Medium Site Index Land Remaining in Wildlife Habitat Sit 2	[VDGIF_AREA = 15 AND "Cisc_GW" MGTY_SITE_CODE >= 050]
15A	Remaining Low Site Index Land in Wildlife Habitat Situation 2	VDGIF_AREA = 15
16B	Medium Site Index Land Remaining in Wildlife Habitat Sit. 3	[VDGIF_AREA = 16 AND "Cisc_GW" MGTY_SITE_CODE >= 050]
1A	Remaining Low Site Index Land in Wildlife Habitat Situation 3	VDGIF_AREA = 16
1A	All remaining stands	

* Nine ATV areas designated in this alternative are Archer, Brushy Mountain, Gate Run, Hickman Draft, Miller Run/Broad Run, Rocky/Black/Maple Complex, South Pedlar, Taskers Gap and Tims Draft.

Constraints Associated With Alternative 12's Theme

In addition to the previously mentioned constraints that were common to alternatives, the following constraint sets were necessary to represent the theme of this alternative

Constraint: Acreage allocation constraint by FORPLAN emphases, thus 655,745 acres of tentatively suitable timberland base is available

Table B-43.
Acreages Assigned to Management Emphases In Alternative 12

Emphases	Acreages
WSSUAM, MINLVL	2,780
WSREAM, MINLVL	9,457
MOTUAM, MOTMVL	5,682
MOTEAM, MOTUAM, MOTMVL	53,302
RMTEAM, RMTUAM, RMT, RMTMVL	55,198
TKYEAM, TKYUAM, TKY, TKYMVL	276,013
BWSTIM, MINLVL	120,328
TIMUAM, MINLVL	12,923
TIMEAM, TIMUAM, MINLVL	120,062
MINLVL	55,626
PRSREN	90,790
VIS	15,113
WLNESS	32,439
MOTMVL	23,278
DEVREC	1,329
DISREC	11,360
RMT, RMTMVL	61,891
TKY, TKYMVL	109,585

Purpose: Limit the land available for various management activities

Rationale: To model the theme of this alternative

Constraint. No more than 40% of the volume in decade 1 can be by clearcutting, 40% modified shelterwood and 20% two-stage shelterwood

Purpose To limit clearcutting.

Rationale Based on the theme of the alternative.

Constraint Cannot allocate more than 5,000 acres to prescribed burning, of this total no more than 20% can be allocated to RMT

Purpose To limit prescribed burning to no more than 500 acres annually.

Rationale. Assume the program is the same as current management.

Constraint Must harvest 45 MMBF/yr in decade 1

Purpose To harvest 45 MMBF/yr in decade 1

Rationale Volume was based on obtaining a projected net revenue estimate as high as possible from this suitable land base

Alternative 13

The ID Team prepared the planning paper *Alternative #13 for Consideration in the Revision of the Land and Resource Management Plan for the George Washington National Forest* to describe the overall purpose of the alternatives, the Forest-wide Standards and the management area prescriptions used in Alternative 13.

Table B-44.
Rules for Assigning Management Areas by Order of Priority for Alternative 13 Maps and Acreages

Mgmt. Area	Description	CISC or GIS Data Layer and Codes
4D	Little Laurel RNA Map	LM_Areas = MA 1
8A	Existing Wilderness	LM_Areas = MA 2
8B	18 Roadless Areas*	RDLS_Areas= 'ADAMS' 'BEARD' 'SHLOS' 'CRFWD' 'DOLLY' 'GUMRN' 'LITMT' 'MILLM' 'MTPLE' 'NMASS' 'OAKKB' 'RMTEX' 'SMREX' 'SMASS' 'FRIAR' 'PREST' 'THRID' 'SISTR'
8B	Boundary Adjusted Jerkemtight and Ramsey's Draft Roadless Areas	MODRDLS_AREAS = 13JERKM or 13RAMEX
4A	Special Biological Niches	SBN layer = All
4C	Geologic Areas	Alt6_Areas = 4C
6	Appalachian Trial	AT_Corr = T1
12	Water	Cisc ANAL_AREA = ' W__'
13A	Lake Moomaw	LM_Areas = MA 11
20B	Utility Corridor/Back Creek	Cisc LNCL = 220 or LM_Areas = MA 12
20C	Communication Sites	Cisc LNCL = 240
1	Existing Wildlife Openings	Cisc LNCL = 250
8B	Boundary Adjusted Little River Roadless Area	MODRDLS_AREAS = 11LRIVR
9	Laurel Fork and Dry River Roadless Areas	RDLS_Areas = LAURL or DRIVR
5A	Hidden Valley & Jackson River	LM_Areas = MA 9 or 17
13A	Crab Tr Falls	LM_Areas = MA 19
10C	All Wild and Scenic Rivers	WS_RVRS = All
9	All SPNM or SPM ROS Classes	ROS = (SPNM or SPM)
7A	High Site Index Land within Sensitivity Level 1 (Foreground or Middleground)	["Cisc_GW" MGTY_SITE_CODE >= 060 and (Sensitivity Level 1 Foreground or Sensitivity Level 1 Middleground from VQO Map)]
1A	Remaining Lower Site Index Land within Same Sensitivity Level 1	[Sensitivity Level 1 Foreground or Sensitivity Level 1 Middleground from VQO Map]
7B	High Site Index Land within Sensitivity Level 2 (Foreground or Middleground)	["Cisc_GW" MGTY_SITE_CODE >= 060 and (Sensitivity Level 2 Foreground or Sensitivity Level 2 Middleground from VQO Map)]
1A	Remaining Lower Site Index Land within Same Sensitivity Level 2	[Sensitivity Level 2 Foreground or Sensitivity Level 2 Middleground from VQO Map]
16A	High Site Index Land within Highly Roaded Areas	[HIGH_ROADS = "High" and "Cisc_GW" MGTY_SITE_CODE >= 060]
1A	Remaining Land within Highly Roaded Areas	[HIGH_ROADS = "High"
15C	High Site Index Land within Moderately Roaded Areas	"Cisc_GW" MGTY_SITE_CODE >= 060
15A	Remaining Land within Moderately Roaded Areas	All remaining stands

* Eighteen roadless areas in this alternative are Adams Peak, Beards Mountain, Big Schloss, Crawford Mountain, Dolly Anne, Gum Run, Little Alleghany Mountain, Mill Mountain, Mount Pleasant, North Massanutten, Oak Knob, Rough Mountain Addition, St Marys Addition, Southern Massanutten, The Friars, The Priest, Three Ridges and Three Sisters

These rules were modified based on specific public comments in the DEIS. The public comments and responses can be found in Appendix I of this document

Constraints Associated With Alternative 13's Theme

In addition to the previously mentioned constraints that were common to alternatives, the following constraint sets were necessary to represent the theme of this alternative.

Constraint Acreage allocation constraint by FORPLAN emphases, thus 409,827 acres of the tentatively suitable timberland base is available

Table B-45.
Acreages Assigned to Management Emphases in Alternative 13

Emphases	Acreages
VISUAM, VISMVL	63,172
VISEAM, VISMVL	150,313
WSSUAM, WSSMVL	2,727
WSREAM, WSSMVL	5,492
TKYEAM, TKY, TKYMVL	138,614
TKYUAM, TKY, TKYMVL	49,509
MINLVL	30,238
PRSREN	346,329
VIS	5,780
WLNESS	240,052
DEVREC	1,329
DISREC	4,138
TKY, TKYMVL	6,099
WSSMVL	1,626
VISMVL	15,662

Purpose Limit the land available for various management activities

Rationale: To model the theme of this alternative.

Constraint. Only two-stage shelterwood and uneven-aged management is allowed

Purpose· To allow no clearcutting.

Rationale Based on the theme of the alternative.

Constraint Cannot allocate more than 2,000 acres to prescribed burning; of this total no more than 20% can be allocated to RMT

Purpose To limit prescribed burning to no more than 200 acres annually

Rationale: Based on the theme of the alternative

Constraint. Only temporary roads can be built to access suitable timber acres.

Purpose. No building of system roads is allowed in this alternative.

Rationale. Based on the theme of this alternative

Constraint. *No timber harvest can occur in SPM and SPNM lands*

Purpose. Based on the theme of this alternative

Rationale Based on the theme of this alternative.

Constraint Must harvest 15 MMBF in the first decade

Purpose Constraint was based on a max PNV run that harvested 15 MMBF in the first decade. Volume was set as a constraint with a max present net revenue objective function This was done to increase the projected net revenue as much as possible from as economically efficient suitable land base as possible

Rationale Based on the theme of this alternative.

Alternative 14

The ID Team prepared the planning paper *Alternative #14 for Consideration in the Revision of the Land and Resource Management Plan for the George Washington National Forest* to describe the overall purpose of the alternatives, the Forest-wide Standards and the management area prescriptions used in Alternative 14

Table B-46.
Rules for Assigning Management Areas by Order of Priority for Alternative 14 Maps and Acreages

Mgmt. Area	Description	CISC or GIS Data Layer and Codes
4D	Little Laurel RNA Map	LM_Areas = MA 1
8A	Existing Wilderness	LM_Areas = MA 2
8B	St. Mary's Roadless Areas	RDLS_Areas= "SMREX"
8B	*Boundary Adjusted Priest and Three Ridges* Roadless Areas	Alt14_AREAS = 8B
4	Special Biological Niches	SBN layer = All
4	Geologic Areas and Larger Niches	Alt14_Areas = 4
6	Appalachian Trial	AT_Corr = T1
6	Additional AT Land near Mt Pleasant	Alt14_AREAS = 6
20	Back Creek Pumped Storage	LM_Areas = MA 12
13	*Lake Moomaw*	*LM_Areas = MA 11*
10	All Wild and Scenic Rivers	WS_RVRS = All
9	Big Schloss	LM_Areas = MA 7
9	Mt Pleasant	LM_Areas = MA 20
9	Ramseys Draft Roadless Area	RDLS_Areas = RAMEX
9	Boundary Adjusted Beards Mt. and Little Alleghany Mt Roadless Areas	MODRDLS_AREAS = 14BEARD or 14LITMT
4	*Dolly Anne*	LM_Areas = MA 3
17	High Site Index Timber	Alt14_AREAS = 17
14A	Remote Habitat	Alt14_AREAS = 14A
14C	Remote Habitat with Timber	Alt14_AREAS = 14C
15	Wildlife Situation 2	Alt14_AREAS = 15
16	Wildlife Situation 3 r	Alt14_AREAS = 16
5	Scenic Mts or Ridges	Alt14_AREAS = 5
7A	Sensitive Road Corridors (Ret)	Alt14_AREAS = 7A
7B	Sensitive Road Corridors (PR)	Alt14_AREAS = 7B
7C	Unsuitable Land within Sensitive Road Corridors	Alt14_AREAS = 7C
7D	Foreground of Scenic Byway	Alt14_AREAS = 7D
7E	Remaining of Scenic Byway	Alt14_AREAS = 7E
9	Remote and Isolated Areas	Alt14_AREAS = 9
9	Modified Little River Roadless Area	Alt14_AREAS = 9B
11	South Pedlar & Modified Boundaries to Brushy Mt, Taskers Gap, and Rocky Run ATV Areas	Alt14_AREAS = 11
13	Heavily Used Dispersed Rec Areas	Alt14_AREAS = 13
13B	Heavily Used Dispersed Rec Areas where Timber Mgmt Allowed	Alt14_AREAS = 13B
1	Minimum Level Management	Alt14_AREAS = 1

Constraints Associated With Alternative 14's Theme

In addition to the previously mentioned constraints that were common to alternatives, the following constraint sets were necessary to represent the theme of this alternative

Constraint Acreage allocation constraint by FORPLAN emphases, thus 605,990 acres of the tentatively suitable timberland base is available

Table B-47.
Acreages Assigned to Management Emphases in Alternative 14

Emphases	Acreages
VISUAM, MINLVL	25,841
VISEAM, VISUAM, MINLVL	13,637
WSSUAM, MINLVL	3,545
WSREAM, MINLVL	7,389
MOTEAM, MOTUAM, MOTMVL	11,211
RMTTEAM, RMTUAM, RMT, RMTMVL	59,634
TKYEAM, TKYUAM, TKY, TKYMVL	245,889
BWSTIM, MINLVL	44,108
TIMEAM, TIMUAM, MINLVL	194,736
MINLVL	65,383
PRSREN	206,564
VIS	7,634
WLNESS	43,938
MOTMVL	3,427
DEVREC	1,329
DISREC	9,190
RMT	99,458
TKY	14,243

Purpose· Limit the land available for various management activities.

Rationale· To model the theme of this alternative

Constraint. Cannot clearcut or seed tree more than 1400 acres in decade 1. Clearcutting is assumed to be 1000 acres of this total

Purpose· Based on the theme of the alternative

Rationale. Based on the theme of the alternative.

Constraint· Cannot allocate more than 30,000 acres to prescribed burning, of this total no more than 20% can be allocated to RMT

Purpose To limit prescribed burning to no more than 3,000 acres annually.

Rationale. Based on the theme of the alternative

Constraint· Suitable land base cannot be more than 350,000 acres

Purpose To reflect the same suitable land base as Alternative 8A

Rationale To compare timber and economic outputs with Alternative 8A.

Constraint· Suitable land base defined as follows

1) Cove hardwoods
2) White Pine
3) Upland hardwoods, Site Index 60 or better
4) Upland hardwoods, Site Index 50, Roaded Natural and Semiprimitive Motorized, and <55% slope
5) All plantations

Purpose· To define enough suitable acres to ensure the ASQ can be implemented and base the criteria on the most economically efficient timberlands.

Rationale To address issue of below cost timber sales.

Constraint Clearcutting only allowed within management areas 16 and 17.

Purpose. To limit clearcutting to only management areas where intensive timber management will be applied

Rationale. Based on the theme of this alternative.

Constraint Maximize projected net revenue

Purpose To obtain as positive projected net revenue as possible subject to the other resource constraints.

Rationale To harvest the timber as economically as possible to address the issue of below cost sales

Constraint. Must harvest 35 MMBF in the first decade

Purpose. To harvest 35 MMBF in Decade 1

Rationale The amount of timber harvested reflects an estimate by each district ranger of what their appropriate district harvest should be from this suitable land base

ESTIMATED EFFECTS OF ALTERNATIVES (STEP 6)

Introduction

This section discusses the outputs and effects of the alternatives The focus is upon the tradeoffs between the alternatives as they provide different levels and mixes of goods and services when addressing the issues.

Presenting the outputs and effects of each alternative facilitates the identification of the alternative which comes closest to maximizing net public benefits In order to accomplish this, there needs to be an understanding of the abilities of the Forest to produce different goods and services in response to the issues identified in EIS Appendix A, and the tradeoffs involved with decisions to produce one mix of outputs as opposed to another As such, the comparative analysis of each alternative in Chapters 2 and 3 of this EIS provides a basis for Planning Step 8 - selection of the preferred Plan alternative for managing the Forest.

Tradeoffs Among Benchmarks

Table B-48 at the end of this document displays the important outputs and effects for each benchmark.

Tradeoffs Among Alternatives

In discussing the differences between alternatives, the focus was upon the resolution of the issues (EIS Appendix A) and the overall tradeoffs incurred in attempting to address the issues The outputs and effects of the alternatives are presented in detail in Chapters 2 and 3 of this EIS Under these circumstances, there is no need to repeat or summarize all the information here Economic effects related to present net value (Table B-49) and cash flow (Table B-50) are summarized at the end of this chapter However, the reader is encouraged to review the results of the alternative analyses presented in these chapters

The following discussion further explains the change in present net value by alternative presented in Table B-49·

Alternative 12 Change in PNV = -$17 5 million

In comparing Alternative 12 to MAXPNV the PNV deceases by $17 5 million
This decrease is for the following reasons

1) Timber benefits decline by $4 4 million because of additional constraints that state the following
   a No more that 45% of the volume harvested in decade 1 can occur on productive class 3 or better lands
   b No more than 40% of the volume in decade 1 can be by clearcutting, 40% modified shelterwood and 20% two-stage shelterwood MAXPNV harvests all the volume by clearcutting
   c Must harvest 45 MMBF/yr in decade 1 This is less than the 53 5 MMBF/yr harvested in the MAXPNV.
2) Wildlife costs increase by $ 9 million because of the 500 acres/year scheduled in the first decade for prescribed burning MAXPNV does not do this practice
3) Engineering costs increase by $ 5 million because of 14.6 miles of new road constructed/reconstructed vs MAXPNV which shows 11 4 miles
4) Other costs increase by $12 1 million because of higher budgets in recreation

On the positive side PNV increases for the following reasons.

1) Timber costs decrease by $1 1 million because of the lower ASQ

Alternative 5 Change in PNV = -$30 7 million

In comparing Alternative 5 to Alternative 12 the PNV deceases by $30 7 million This decrease is for the following reasons

1) Recreation benefits decline by $15 6 million because Alternative 5 does not meet the demand for Semiprimitive Motorized Recreation in terms of recreation visitor days Alternative 12 does meet this demand
2) Wildlife benefits decline by $17 8 million because Alternative 5 does not meet the demand for Turkey and Deer Alternative 12 does meet this demand
3) Timber costs increase by $13 9 million because of the increase in ASQ from 45 MMBF/yr in decade 1 for Alternative 12 to 68 MMBF/yr
4) Engineering costs increase by $3 1 million because of 17 4 miles of new roads constructed/reconstructed vs Alternative 12 which shows 14 6 miles

On the positive side PNV increases for the following reasons

1) Timber benefits increase by $17 4 million because of relaxing the following constraints applied in Alternative 12

a Clearcutting can be applied to all acres in Alternative 5. This compares to no more than 40% clearcutting for Alternative 12

b Alternative 5 must harvest 68 MMBF/yr in decade 1 and no more than timber demand +50% for decades 2 to 5 (i e 80, 86, 89, 89 MMBF/yr). This compares to 45 MMBF/yr in decade 1 for Alternative 12

2) Other costs decrease by $2 3 million because of lower budgets in recreation

Alternative 2 Change in PNV = -$11 1 million

In comparing Alternative 2 to Alternative 5 the PNV deceases by $11 1 million This decrease is for the following reasons·

1) Timber benefits decrease by $25 0 million because of the following constraints applied in Alternative 2·

a Must harvest the four year average from 1988 - 1991 by cutting system in the first decade (i e 83% clearcutting, seed tree, and removal, 13% by modified shelterwood; 1% two-stage shelterwood, and 3% group selection Alternative 5 allowed clearcutting on all acres

b Alternative 2 must harvest 38 MMBF in the first decade Alternative 5 must harvest 68 MMBF/yr in decade 1 and no more than timber demand +50% for decades 2 to 5 (i e 80, 86, 89, 89 MMBF/yr).

2) Wildlife benefits decline by $38 5 million because Alternative 2 produces less deer wildlife user days than Alternative 5

On the positive side PNV increases for the following reasons.

1) Recreation benefits increase by $15 6 million because Alternative 2 does meet the demand for all types of recreation and wilderness terms of recreation visitor days Alternative 5 does not meet the demand for Semi-Primitive Motorized Recreation

2) Timber costs decrease by $22 7 million because of the decrease in ASQ from 68 MMBF/yr in decade 1 for Alternative 5 to 38 MMBF/yr

3) Engineering costs decrease by $5 0 million because of 10 4 miles of new roads constructed/reconstructed vs Alternative 5 which shows 17 4 miles

4) Other costs decrease by $9 1 million because of lower budgets in recreation.

Alternative 3 Change in PNV = -$8 9 million

In comparing Alternative 3 to Alternative 2 the PNV deceases by $8 9 million This decrease is for the following reasons

1) Timber benefits decrease by $29 4 million because no timber harvesting occurs in Alternative 3 vs 38 MMBF/year in the first decade for Alternative 2

2) Recreation benefits decrease by $47 2 million because Alternative 3 does not produce any Semi-Primitive Motorized recreation user days Alternative 2 meets the demand of all types of recreation and wilderness when measured in user days

3) Wildlife benefits decline by $42 9 million because Alternative 3 produces less deer and turkey wildlife user days than Alternative 2

On the positive side PNV increases for the following reasons

1) Timber costs decrease by $36 3 million because of the decrease in ASQ from 38 MMBF/yr in decade 1 for Alternative 2 to 0 MMBF/yr.

2) Engineering costs decrease by $56 5 million because of 0 miles of new roads constructed/reconstructed vs Alternative 2 which shows 10 4 miles Alternative 3 also reflects reduced costs for facility construction and maintenance, road maintenance, and recreation road construction when compared to all other alternatives

3) Wildlife costs decrease by $17 8 million because of no wildlife and fish structural and non-structural improvements Only a minimum program is recommended for protecting Threatened and Endangered Species

4) Other costs decrease by $0 1 million because of lower budgets in recreation and higher budgets in fire

Alternative 10 Change in PNV = -$4 7 million

In comparing Alternative 10 to Alternative 3 the PNV decreases by $4 7 million This decrease is for the following reasons

1) Timber costs increase by $15 1 million because of the increase in ASQ from 0 MMBF/yr in decade 1 for Alternative 3 to 15 MMBF/yr

2) Engineering costs increase by $53 7 million because of 3 8 miles of new roads constructed/reconstructed vs Alternative 3 which shows 0 miles Alternative 10 also reflects increased costs for facility construction and maintenance, road maintenance, and recreation road construction when compared to Alternative 3

3) Wildlife costs increase by $30.8 million because 30,000 acres are allocated to prescribed burning and fish structural and non-structural improvements do occur. This compares to Alternative 3 which allows no wildlife and fish structural and non-structural improvements

On the positive side PNV increases for the following reasons:

1) Timber benefits increase by $12 8 million because Alternative 10 must harvest 15 MMBF/yr in the first decade vs no timber harvesting occurs in Alternative 3

2) Recreation benefits increase by $47 2 million because Alternative 10 meets the demand for all types of recreation and wilderness when measured in user days Alternative 3 does not produce any Semi-Primitive Motorized recreation user days.

3) Wildlife benefits increase by $25 7 million because Alternative 10 produces more deer and turkey wildlife user days than Alternative 3.

4) Other costs decrease by $9 2 million because of lower budgets in lands and fire

Alternative 6 Change in PNV = -$5 0 million

In comparing Alternative 6 to Alternative 10 the PNV decreases by $5 0 million. This decrease is for the following reasons.

1) Timber benefits decrease by $12.8 million because Alternative 6 harvests no timber vs Alternative 10 which harvests 15 MMBF/yr in the first decade

2) Wildlife costs increase by $26 3 million because 360,000 acres are allocated to wildlife clearings with 2,355 acres/yr scheduled in the first decade

3) Other costs increase by $30 4 million because of higher budgets in recreation

On the positive side PNV increases for the following reasons:

1) Wildlife benefits increase by $43 5 million because Alternative 6 produces more deer and turkey wildlife user days than Alternative 10

2) Timber costs decrease by $15 1 million because of the decrease in ASQ from 15 MMBF/yr in decade 1 for Alternative 10 to 0 MMBF/yr.

3) Engineering costs decrease by $5 9 million because Alternative 6 builds no new roads vs 3 8 miles of new roads constructed/reconstructed for Alternative 10

Alternative 8A Change in PNV = -$7 0 million

In comparing Alternative 8A to Alternative 6 the PNV decreases by $7.0 million. This decrease is for the following reasons:

1) Timber costs increase by $32 3 million because of the increase in ASQ from 0 MMBF/yr in decade 1 for Alternative 6 to 33 MMBF/yr

2) Engineering costs increase by $9 0 million because Alternative 8A builds 10.2 miles of new roads constructed/ reconstructed vs no new roads for Alternative 6.

3) Other costs increase by $12.5 million because of higher budgets in recreation, fire, lands, minerals, soil and water, range and law enforcement

On the positive side PNV increases for the following reasons:

1) Timber benefits increase by $25 3 million because Alternative 8A harvests 33 MMBF/yr in the first decade vs Alternative 6 which harvests 0 MMBF/yr in the first decade

2) Wildlife costs decrease by $21 1 million because of the decrease in wildlife openings from 2,355 acres/yr scheduled in the first decade for Alternative 6 to 400 acres/yr scheduled in the first decade for Alternative 8A.

Alternative 8 Change in PNV = -$11.5 million

In comparing Alternative 8 to Alternative 8A the PNV decreases by $11.5 million. This decrease is for the following reasons:

1) Timber benefits decrease by $4 2 million because Alternative 8 harvests 27 MMBF/yr in the first decade vs Alternative 8A which harvests 33 MMBF/yr in the first decade

2) Wildlife benefits decrease by $12 7 million because Alternative 8 produces fewer deer and turkey wildlife user days than Alternative 8A

3) Other costs increase by $0 9 million because of higher budgets in recreation

On the positive side PNV increases for the following reasons

1) Timber costs decrease by $5 0 million because of the decrease in ASQ from 33 MMBF/yr in decade 1 for Alternative 8A to 27 MMBF/yr.

2) Engineering costs decrease by $1 3 million because Alternative 8 builds 8 2 miles of new roads constructed/reconstructed vs 10.2 miles of new roads constructed/reconstructed for Alternative 8A

Alternative 7 Change in PNV = -$3.7 million

In comparing Alternative 7 to Alternative 8 the PNV decreases by $3.7 million This decrease is for the following reasons.

1) Timber costs increase by $27.9 million because of the increase in ASQ from 27 MMBF/yr in decade 1 for Alternative 8 to 52 MMBF/yr

2) Engineering costs increase by $3 8 million because Alternative 7 builds 17 8 miles of new roads constructed/reconstructed vs 8 2 miles of new roads constructed/reconstructed for Alternative 8.

3) Wildlife costs increase by $30 6 million because of the increase in wildlife openings from 400 acres/yr scheduled in the first decade for Alternative 8 to 3,095 acres/yr scheduled in the first decade for Alternative 7

4) Other costs increase by $5.6 million because of higher budgets in recreation.

On the positive side PNV increases for the following reasons.

1) Timber benefits increase by $21 9 million for the following reasons

a Alternative 7 harvests 52 MMBF/yr in the first decade vs Alternative 8 which harvests 27 MMBF/yr in the first decade.

b Alternative 7 has no limits on clearcutting Alternative 8 limits clearcutting to no more than 300 acres

2) Wildlife benefits increase by $42 3 million because Alternative 7 meets the demand for turkey and deer Alternative 8 does not meet this demand

Alternative 14 Change in PNV = -$5 3 million

In comparing Alternative 14 to Alternative 7 the PNV decreases by $5 3 million This decrease is for the following reasons

1) Timber benefits decrease by $13 2 million for the following reasons.

a Alternative 14 harvests 35 MMBF/yr in the first decade vs Alternative 7 which harvests 52 MMBF/yr in the first decade

b Alternative 14 limits clearcutting to no more than 1000 acres Alternative 7 has no limits on clearcutting

2) Wildlife benefits decrease by $31 2 million because Alternative 14 produces fewer turkey and and deer than Alternative 7. demand

3) Other costs increase by $22 8 million because of higher budgets in recreation.

On the positive side PNV increases for the following reasons

1) Timber costs decrease by $18 9 million because of the decrease in ASQ from 52 MMBF/yr in decade 1 for Alternative 7 to 35 MMBF/yr

2) Engineering costs decrease by $2 3 million because Alternative 14 builds 9 8 miles of new roads constructed/reconstructed vs 17 8 miles of new roads constructed/reconstructed for Alternative 7

3) Wildlife costs decrease by $40 7 million because of the decrease in wildlife openings from 3,095 acres/yr scheduled in the first decade for Alternative 7 to no wildlife clearings occurring in Alternative 14.

Alternative 13 Change in PNV = -$0 5 million

In comparing Alternative 13 to Alternative 14 the PNV decreases by $0.5 million This decrease is for the following reasons

1) Timber benefits decrease by $16 0 million for the following reasons

a Alternative 13 harvests 15 MMBF/yr in the first decade vs Alternative 14 which harvests 35 MMBF/yr in the first decade

b Alternative 13 does not allow any clearcutting to occur, while Alternative 14 limits clearcutting to no more than 1000 acres

c Alternative 13 does not allow any timber harvesting in semi-primitive motorized and semi-primitive non-motorized lands

2) Recreation benefits decrease by $24 0 million because Alternative 13 doe not meet the demand for semi-primitive motorized recreation when measured in visitor days
3) Wildlife benefits decrease by $41 1 million because Alternative 13 produces fewer turkey and deer than Alternative 14

On the positive side PNV increases for the following reasons
1) Timber costs decrease by $16 1 million because of the decrease in ASQ from 35 MMBF/yr in decade 1 for Alternative 14 to 15 MMBF/yr
2) Engineering costs decrease by $8 9 million because Alternative 13 builds no new roads vs 9 8 miles of new roads constructed/reconstructed for Alternative 14.
3) Wildlife costs decrease by $8 6 million because of the decrease in prescribed burning from 500 acres/yr scheduled in the first decade for Alternative 14 to 200 acres/yr scheduled in the first decade for Alternative 13
4) Other costs decrease by $47 0 million because of lower budgets in recreation

Alternative 11 Change in PNV = -$29 6 million

In comparing Alternative 11 to Alternative 13 the PNV decreases by $29 6 million This decrease is for the following reasons
1) Timber costs increase by $7 7 million because of the increase in ASQ from 15 MMBF/yr in decade 1 for Alternative 13 to 21 MMBF/yr
2) Wildlife costs increase by $1 9 million because of the increase in prescribed burning from 200 acres/yr scheduled in the first decade for Alternative 13 to 500 acres/yr scheduled in the first decade for Alternative 11
3) Other costs increase by $68 1 million because of higher budgets in recreation

On the positive side PNV increases for the following reasons
1) Timber benefits increase by $2 6 million because Alternative 11 harvests 21 MMBF/yr in the first decade vs Alternative 13 which harvests 15 MMBF/yr in the first decade
2) Recreation benefits increase by $24 0 million because Alternative 11 meets the demand for all types of recreation and wilderness user days
3) Wildlife benefits increase by $21 5 million because Alternative 11 produces more turkey and deer than Alternative 13

Alternative 9 Change in PNV = -$0 7 million

In comparing Alternative 9 to Alternative 11 the PNV decreases by $0 7 million This decrease is for the following reasons
1) Timber benefits decrease by $10 9 million because of the following reasons
   a The decrease in ASQ from 21 MMBF/yr in decade 1 for Alternative 11 to 8 MMBF/yr for Alternative 9
   b Alternative 9 harvests all timber by uneven-aged management
2) Wildlife benefits decrease by $38 7 million because Alternative 9 produces fewer turkey and deer than Alternative 11
3) Recreation benefits decrease by $39 6 million because Alternative 9 does not meet the demand for semi-primitive motorized recreation when measured in user days while Alternative 11 meets the demand for all types of recreation and wilderness user days
4) Engineering costs increase by $4 2 million because Alternative 9 builds 2 6 mile of new roads constructed/reconstructed vs no new roads for Alternative 11

On the positive side PNV increases for the following reasons
1) Timber costs decrease by $14 4 million because Alternative 9 harvests 8 MMBF/yr in the first decade vs Alternative 11 which harvests 21 MMBF/yr in the first decade
2) Wildlife costs decrease by $0 8 million because slightly lower habitat improvement costs than Alternative 11
3) Other costs decrease by $77 5 million because of lower budgets in recreation

Alternative 4 Change in PNV = -$45 0 million

In comparing Alternative 4 to Alternative 9 the PNV decreases by $45 0 million This decrease is for the following reasons
1) Wildlife benefits decrease by $35 1 million because Alternative 4 produces fewer bear, turkey and deer than Alternative 9
2) Timber costs increase by $25 4 million because Alternative 4 harvests 40 MMBF/yr in the first decade vs Alternative 9 which harvests 8 MMBF/yr in the first decade
3) Engineering costs increase by $18 7 million because Alternative 4 builds 12 2 miles of new roads constructed/ reconstructed vs Alternative 9 which builds 2 6 miles of new roads constructed/reconstructed

4) Other costs increase by $47 9 million because of higher budgets in recreation, soil and water, and law enforcement

On the positive side PNV increases for the following reasons

1) Timber benefits increase by $28 2 million because of the following reasons·

a The increase in ASQ from 8 MMBF/yr in decade 1 for Alternative 9 to 40 MMBF/yr for Alternative 9

b. Alternative 4 harvests all timber by clearcutting, seed tree and/or, modified shelterwood vs all uneven-aged management for Alternative 9

2) Recreation benefits increase by $35 7 million because Alternative 4 meets the demand for all types of recreation and wilderness except for semi-primitive non-motorized when measured in user days Alternative 9 does not meet the demand for semi-primitive motorized recreation

3) Wildlife costs decrease by $18 2 million because Alternative 4 does less habitat improvement than Alternative 9

MacCleery Decision

On July 31, 1985, Deputy Assistant Secretary of Agriculture Douglas W. MacCleery rendered the *USDA Decision on Review of Administrative Decision by Chief of the Forest Service Related to the Administrative Appeals of the Forest Plans and EISs for the San Juan National Forest and the Grand Mesa, Uncompahgre, and Gunnison National Forests* This was a benchmark decision that established the Department of Agriculture requirements for economic analysis needed to support a below-cost timber sale program that is designed to provide multiple-use benefits

The Land and Resource Management Plan for the San Juan National Forest and the Grand Mesa, Uncompahgre, and Gunnison National Forest (the San Juan - GMUG Forest Plan) depicted a situation similar to that on the George Washington National Forest where the timber program was substantially below-cost As with the *Land and Resource Management Plan for the George Washington National Forest*, the San Juan - GMUG Forest plan was using the timber program to achieve "other resource benefits" Deputy Assistant Secretary MacCleery explained that where the timber program is being used to achieve other resource benefits, the Forest faces an additional burden of analysis to justify the use of timber harvesting for such purposes

The MacCleery decision indicates that the planning documents should have the information to address the following questions·

1) Is it possible to achieve the non-timber benefits more cost effectively than with timber sales?

2) To what extent can timber costs be cut or revenues increased while maintaining the appropriate level of non-timber objectives?

3) Does the demand for non-timber objectives support the need for the expenditures to meet them?

4) If the vegetation management program did not include sales whose costs were greater than revenues, what non-timber or amenity benefits would be lost? Who would be affected and how?

Question 1

In response to the first question the Forest developed Alternative 6 Alternative 6 must produce at least the same amount of bear, deer, and turkey benefits as Alternative 8A (preferred alternative) without using scheduled timber sales The only management practices available in Alternative 6 to achieve these wildlife objectives were prescribed burning and/or wildlife clearings Alternative 6 did 3,000 acres/year of prescribed burning and 2,355 acres/year of wildlife clearings Alternative 8A allows scheduled timber sales and did 2,355 acres/year of this practice along with 3,000 acres/year of prescribed burning and 400 acres/year of wildlife clearings In order to answer this question the discounted timber, engineering, and wildlife costs were subtracted from the discounted timber and wildlife benefits for Alternative 6 and Alternative 8A (See table B-49) This computation results in Alternative 6 having a net benefit of 590 3 million dollars and Alternative 8A having a net benefit of 595 8 million dollars Thus, using timber sales along with prescribed burning and wildlife clearings (i e Alternative 8A) is more cost efficient than only doing prescribed burning and wildlife clearings (i e Alternative 6) to meet non-timber benefits

The conclusions for this analysis were very similar to an earlier nationwide study that was completed in September 1992 titled *Forest Management Budget/Cost Analysis with focus on the Timber Program of the George Washington National Forest* The conclusions from this study indicated that the option which utilized timber sales to meet non-timber resource objectives (Scenario 3) had a lower "net effect" (Budget + Other Appropriation - Revenues) than the option which allowed no timber harvest (Scenario 2) The two analysis differ primarily in that this procedure uses current annual costs and values in a cash flow analysis, while the above procedure uses discounted costs and values in a present net value analysis

Question 2

The effectiveness of cost reduction initiatives on the GWNF is readily apparent when comparing the annual cost of the timber sale program since 1987 There has been considerable lowering of total cost each year. Annual total costs were reduced $521,000 in FY1988, further reduced $660,000 in FY1989, and even further reduced $131,000 in FY1990

The most significant reductions have occurred in engineering support The total cost of engineering support consists of transportation planning, road design and construction, and purchaser road credit These significant cost reductions were brought about by aggressively reducing annual mileage of specified roads and virtual elimination of pre-roading In addition, the GWNF aggressively used cost analysis to design roads to a standard which is both cost-effective and environmentally sound.

When using FY1987 as a starting point, annual General Administration (GA) costs were reduced $50,000 in FY1988, further reduced $221,000 in FY1989, and even further reduced $58,000 in FY1990 This reduction is a direct result of the "charge-as-worked" concept and shifting of GA expenses to other resource programs that are now experiencing expanded budgets, such as the GWNF wildlife and recreation programs.

Based on implementing the above procedures unit costs have been reduced from $59.72/MBF Harvest in 1988 to $50 55/MBF Harvest in 1991

Since 1990, the Forest has not only focused on efforts to reduce costs but also to improve revenues through timber sale packaging initiatives that focus on hardwood sawtimber marketing opportunities Priority will be given to harvesting high value stands with high regeneration priority or in imminent threat of Gypsy Moth damage Additional consideration will be given to making low value products optional material for bidding or removal when this makes value products more marketable. Low value and medium value sales to meet other resource objectives will be packaged to maximize sale marketability

Based on implementing the above procedure unit revenues have been increased from $18.76/MBF in 1988 to $39 38/MBF in 1992

For further information on how the George Washington National Forest has reduced timber costs or increased revenues the process paper *Cost Efficiency Final Report/Action Plan November 1992 George Washington National Forest* should be reviewed

Question 3

As discussed earlier in this Appendix a demand analysis was completed for big game wildlife (i e bear, deer, and turkey). Based on the results of this analysis the demand for these species was 27,773 wildlife user days for bear, 215,568 wildlife user days for deer, and 100,725 wildlife user days for turkey. Alternative 8A produced the following results. 46,194 wildlife user days for bear, 180,907 wildlife user days for deer, and 97,086 wildlife user days for turkey. Based on this analysis it can be concluded that the demand for deer and turkey does support the need for expenditures to meet them

Question 4

The Forest was unable to develop an alternative that had an above cost timber program. This was due primarily to the fixed costs associated with overhead and assessment However, an alternative was developed to include a timber sale program of least-net-cost. Alternative 10 has the highest projected net revenue of any of the alternatives that harvest timber Therefore to answer the questions of what non-timber or amenity benefits would be lost and who would be affected and how, the change in Alternative 10 from Alternative 8A is displayed as follows.

	Alternative 10 change from Alternative 8A
Timber(Jobs)	-144
Recreation(Jobs)	0
Wildlife(Jobs)	-103
F S Expenditures(Jobs)	-60
25% Fund(M$)	-124

deer(#)	-12,179
bear(#)	-7
turkey(#)	-3,673

Based on this analysis it can be seen that jobs related to timber, wildlife and Forest Service expenditures would all decline if Alternative 10 was implemented. Nontimber and amenity benefits related to populations of big game wildlife would also decline significantly Finally returns to the federal treasury would decrease also. The primary reason for decreases in all of these outputs is that Alternative 10 harvests less than half the timber volume Alternative 8A does.

Table B-48
Tradeoffs Among Benchmarks
(Average Annual in Decade 1)

	CUR[1]	TIM	MKT	PNV	MIN	GAM	SPM	SPNM[2]	WLD[3]
Present Net Value (MM$ - 150 years)	1254	1095	-302	1314	1208	1205	1265	1245	1178
Total Cost (MM$)	14	20	14	14	2	16	14	9	13
Timber (MMBF)	38	186	45	53	0	68	36	0	8
Suitable Land (MACRES)	300	915	331	540	0	851	546	0	70
Big Game (MWUDS)									
Bear	44	22	41	51	49	64	36	49	49
Turkey	81	62	75	101	77	142	65	77	79
Deer	157	258	173	224	104	287	220	104	111
Recreation (MRVDS)									
Roaded Modified	0	38330	13348	0	0	0	0	0	0
Roaded Natural	34451	6518	19158	32384	35997	32384	32384	9049	31383
Semi-primitive Motorized Roads Open	270	115	285	241	289	0	508	0	14
Semi-primitive Motorized Roads Closed	0	0	0	73	0	506	0	0	5
Semi-primitive Non-Motorized	227	0	246	200	0	0	13	554	289
Wilderness (MACRES	32	32	32	32	32	32	32	556	275

[1]Same as Alternative 2
[2]Same as Alternative 3 Wilderness acres greater than WLD because some lands outside of inventoried roadless areas are allocated to wilderness
[3]Same as Alternative 9

Table B-49.
Present Value Analysis of Alternatives - Contributions to Costs and Benefits
Ranked According to Highest Present Net Value
(Millions of Dollars - 4% discount rate)

		Present Net Values		Costs				Benefits			
Alternative	PNV	Costs	Benefits	Timber	Engineering	Wildlife	Other 1/	Timber	Recreation	Wildlife	Other 2/
MAXPNV	1313 8	345 3	1659 1	46 2	73.6	18 8	206 7	41 4	873 9	743 6	2
12	1296.3	357 7	1654 0	45.1	74.1	19 7	218 6	37 0	873 9	742.9	2
5	1265 6	372 4	1638 0	59 0	77 2	19 7	216 5	54.4	858 3	725 1	2
2	1254 5	335.6	1590 1	36 3	72 2	19 7	207 4	29.4	873 9	686 6	2
3	1245 6	225 0	1470.6	0	15 8	1.9	207 3	0	826 7	643 7	2
10	1240 9	315 4	1556.3	15 1	69 5	32 7	198 1	12 8	873 9	669 4	2
6	1235 9	351.1	1587 0	0	63 6	59 0	228 5	0	873 9	712 9	2
8A	1228 9	383 8	1612 7	32.3	72 6	37 9	241 0	25 3	873.9	713 3	2
8	1217 4	378 4	1595 8	27 3	71 3	37 9	241 9	21 1	873 9	700 6	2
7	1213.7	446 3	1660 0	55 2	75 1	68 5	247 5	43 0	873 9	742 9	2
14	1208 4	407.2	1615 6	36 3	72.8	27 8	270 3	29 8	873 9	711.7	2
13	1207 9	326 6	1534 5	20.2	63 9	19 2	223.3	13.8	849.9	670 6	.2
11	1178 3	404 3	1582 6	27 9	63 9	21 1	291.4	16.4	873.9	692 1	2
9	1177.6	315 8	1493 4	13 5	68 1	20 3	213 9	5 5	834.3	653 4	.2
4	1132 6	389 6	1522.2	38 9	86 8	2.1	261 8	33.7	870 0	618 3	.2

1/ Other costs include recreation, lands, fire, minerals, soil & water, range, planning, law enforcement, and general administration

2/ Other benefits include mineral leases (oil and gas)

Table B-50
Cash Flow Analysis of Alternatives
Ranked According to Highest Present
Net Value (1989 M Dollars)

Alternatives	Total Receipts	Total Costs	Net Receipts
MAXPNV	1917	13862	-11945
12	1498	14507	-13009
5	2155	14909	-12754
2	1316	13665	-12349
3	262	8903	- 8641
10	681	12805	-12124
6	262	14266	-14004
8A	1177	15173	-13996
8	1011	14970	-13959
7	1699	17970	-16271
14	1235	16391	-15156
13	679	13232	-12553
11	820	16318	-15498
9	451	12859	-12408
4	1369	15744	-14375

APPENDIX C
EVALUATIONS OF GWNF ROADLESS AREAS

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INTRODUCTION

This appendix contains evaluation reports on the Forest's 27 roadless areas. The roadless areas -- totalling more than 260,000 acres -- could be recommended to Congress for designation as wilderness. (See the Glossary for definitions of roadless area and wilderness.)

The evaluation reports rate the potential of the Forest's roadless areas in three categories: **capability** - the qualities that make a roadless area suitable or not suitable for wilderness; **availability** - the non-wilderness resources and demands of the area; **need** - the amount of wilderness already in the area and region.

Wildernesses already in the area/region amount to 174,000-plus acres of congressionally designated wilderness in Virginia and 78,000-plus acres in the Monogahela National Forest in neighboring West Virginia. While the existing wildernesses contain some unique geological, ecological, or scenic sites, overall they are representative of the Appalachian hardwood forests. A breakdown of number of acres per wilderness area is in Table C-1.

All of the Forest's roadless areas lie within the Blue Ridge and Ridge and Valley physiographic provinces. These landforms are represented in several wildernesses in the George Washington and Jefferson national forests and in the Shenandoah National Park.

Based on the Bailey-Kuchler classification system, all 27 roadless areas are classified as Appalachian Oak Forest within the Eastern Deciduous Forest Province. This ecosystem is represented in several wildernesses in the George Washington and Jefferson national forests and in the Shenandoah National Park.

Other qualities in common in the 27 areas include: no airstrips, no heliports, no electronic installations. Additionally, no more than 20 percent of any area has been harvested within the past 10 years. No area contains more than one-half mile of improved system road (gravel or less) for each 1,000 acres of land involved. All roads in the areas are under Forest Service jurisdiction.

Table C-1.
Existing Wilderness in Virginia and West Virginia

National Forest or Park	Area	Acres
George Washington NF	Saint Mary's	10,000
	Ramseys Draft	6,519
	Rich Hole	6,450
	Rough Mountain	9,300
	Barbours Creek	20
	Shawyers Run	95
	Total	32,384
Jefferson National Forest	James River Face	9,000
	Thunder Ridge	2,450
	Barbours Creek	5,700
	Shawvers Run	3,665
	Mt Lake	10,753
	Peters Mt	3,326
	Kimberling Creek	5,580
	Beartown	6,375
	Little Dry Run	3,400
	Little Wilson	3,855
	Lewis Fork	5,802
	Total	59,906
Shenandoah Nat'l Park	Total-11 Separate Units	82,260
Monogahela National Forest	Cranberry	35,864
	Dolly Sods	10,215
	Laurel Fork, North	6,055
	Laurel Fork, South	5,997
	Otter Creek	20,000
	Total	78,081
	Grand Total	**252,681**

George Washington National Forest
Pedlar Ranger District

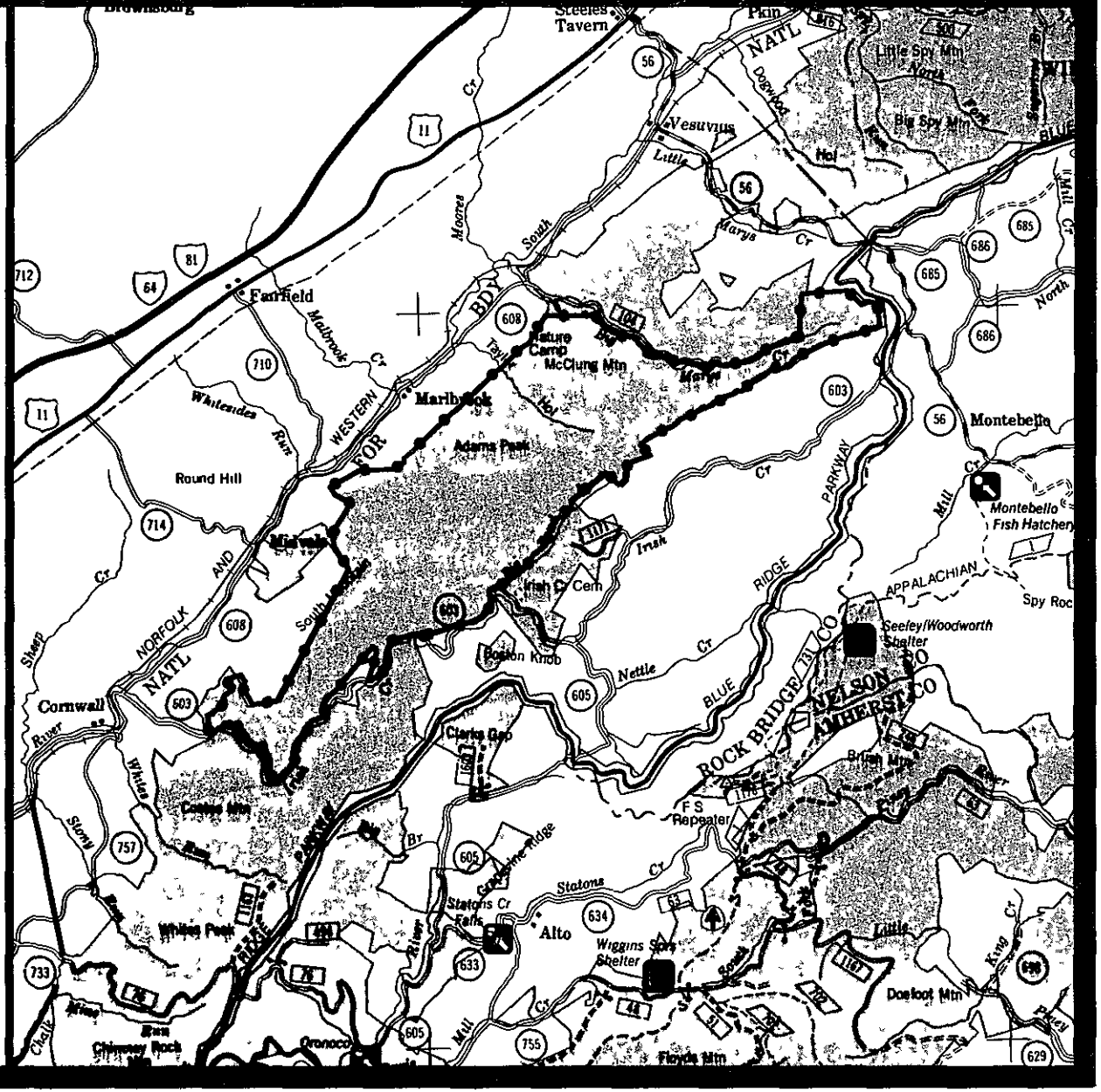
ADAMS PEAK ROADLESS AREA

Scale

1:126,720

1/2 inch = 1 mile

Roadless Area



ADAMS PEAK ROADLESS AREA

I DESCRIPTION

Acres: approximately 7,076

Location and vicinity The ADAMS PEAK AREA is located in the west central portion of the Pedlar Ranger District, George Washington National Forest, Rockbridge County, Virginia Buena Vista and Lexington, Virginia are approximately 8 miles to the southwest

The area is bordered by Big Marys Creek on the north, the National Forest (NF) boundary for the most part, on the west, State Route 603 on the south, and a combination of State Route 603 (Irish Creek Road), NF boundary, and Forest Road 1171 on the south and east

Access, including roads and trails leading to the area. Access to the north end is by Forest Road 104 (Big Mary Road), and State Route 603 along the southern and eastern portions of the area Access through the area by foot is provided on Forest Trail 523 (Whetstone Ridge Trail) The trail can be accessed at Whetstone Ridge on the Blue Ridge Parkway and at State Route 603

General description of the area geography This area is in the Blue Ridge Complex, called the Blue Ridge-Catoctin Mountain anticlinerium, and is a sequence of Cambrian volcanic and sedimentary rocks The soils are in the Antietam-Leetonia-Rubble and Cardiff-Unicoi Associations

General description of the area topography The important topographic features include the rugged and steep Whetstone Ridge and South Mountain along the crest of the Blue Ridge Elevations range from 1200 to 3200 feet above sea level Deep, narrow drainages with steep side slopes are common Flooding from Hurricane Camille in 1969 has scoured out the streambeds three to six feet in depth Most of the streams have since healed over There are rock slides scattered throughout the area Precipitation drains into either Big Marys Creek or Irish Creek, and then into the South River or, Maury River which are tributaries of the James River of the Middle Atlantic Drainage Area

General description of the area vegetation, including the ecosystem type The entire area is forested with Eastern deciduous forest species Most of the area has low quality pitch pine and upland hardwoods, but there are some hemlock stringers and cove hardwoods in the hollows The understory is made up of mountain laurel, dogwood, grape, and rhododendron There is some mortality in the area due to the southern pine beetle, mostly sustained during the mid-70s and late 80s

Key attractions, including sensitive wildlife and scenic landmarks. The main attraction for this area is the Whetstone Ridge Trail, used moderately by hikers and hunters The Nature Camp on Big Marys Creek, just outside the northern boundary, is under special use permit to the Virginia Federation of Garden Clubs who conducts educational programs during the summer The students and faculty at the Nature Camp use the surrounding area for hiking and other environmental activities

There are no records of any sensitive plant or animal species However, a formal inventory has not been performed

II INVENTORY

<u>Human Influence</u>

To what degree have humans and past and present human activity affected natural ecological processes and conditions? Southern Pine Beetle salvage operations were completed in 1975 on South Mountain The old jeep trail up South Mountain has been permanently closed to protect the watershed and reduce disturbance to black bear This trail is open to foot travel The Whetstone Ridge Trail is periodically maintained No timber management activities have occured in recent years due to the low quality of timber and lack of access

To what degree is the area natural or natural appearing and free from disturbance? Except for salvage efforts on South Mountain, there is no evidence of disturbance The salvage efforts will gradually heal and become muted

If the area ecological processes and/or natural appearance have been altered by past or present human activity, is the land regaining a natural, untrammeled appearance? The overall appearance of Adams Peak is natural and untrammeled

Does the existing or attainable National Forest System ownership pattern, both surface and subsurface, ensure perpetuation of identified wilderness value? There are no apparent ownership patterns that would preclude perpetuation of wilderness values

Is more than 15 percent of the area in non-native vegetation? No

Improvements, Structures, and Nonconforming Uses

Are any of the following types of areas, features or nonconforming uses present? If so, where?

Areas with evidence of historic mining at least 50 years old (Do not include areas of significant current mineral activity): NONE

Areas under current mineral lease that contain a "no surface occupancy" stipulation: NONE

Areas under current mineral lease where the lessee has not exercised development and occupancy rights: NONE

Recreation improvements such as occupancy spots or minor hunting or outfitter camps· There are some dispersed campsites in the area

Timber harvest areas where logging and prior road construction are or are not evident· The old road up South Mountain was used to haul out the dead timber from the Southern Pine Beetle Salvage Sale in 1975 The salvage area is natural appearing

Cultural treatments involving plantations or plantings: NONE

Private inholdings in the area· NONE

Dwellings on private inholdings: NOT APPLICABLE

Nonconforming structures and improvements: NONE

Ground-return telephone lines: NONE

Watershed treatment areas. NONE

Roads: There are no system roads in the Adams Peak area

Can existing non-conforming uses be effectively mitigated or terminated through removal or rapid natural deterioration? NOT APPLICABLE

Are improvements in the area being affected by the forces of nature rather than humans, and are they disappearing or muted? Past activities, including the salvage areas on South Mountain are gradually returning to a natural appearance

III EVALUATION

Capability

Does the area contain the basic characteristics that make it suitable for wilderness designation without regard to its availability for or need as wilderness? Consider the following characteristics in analyzing the quality of the wilderness resource. If these characteristics are determined to be important, describe and refer to them.

Experiential benefits. Does that area provide the opportunity for solitude and serenity? Opportunities for solitute and serenity are good in area's interior, and poor in the eastern and western portions due to sights and sounds of man coming from adjacent private lands and development There is a considerable amount of rural development on the private lands adjacent to the area's western boundary Traffic volume on surrounding roads is moderate.

Challenge. Does the area offer visitors the opportunity to experience adventure, excitement, challenge, initiative, or self-reliance. Is access easy or difficult? Access is provided on Whetstone Trail which contains some rough sections that would provide some challenge to the novice Opportunities to experience adventure or use initiative are similar to those for other relatively large, undisturbed areas of the Eastern U S

Outdoor Recreation Opportunities. What is the area capability for providing primitive and unconfined types of recreation including:

Camping - There are ample opportunities for primitive camping

Hunting - Hunting opportunities for small and large game are available, however, use is light because of difficulty of access and the ruggedness of the terrain

Fishing - There are no native trout streams in the area

Mountain Climbing - Opportunities for mountain climbing are limited in the area What opportunities do exist, primarily on Adams Peak and McClung Peak, are more suited to the novice

Ski Touring - This activity is limited by insufficient amounts of snow and lack of suitable routes

Canoeing - There are no streams or rivers large enough to support this activity

Boating - There are no streams or rivers large enough to support this activity

River Rafting - There are no streams or rivers large enough to support this activity

Backpacking - There are good opportunities for backpacking Cross-country travel inside the area would be difficult due to the steep terrain

Hiking - Trail hiking is limited to the Whetstone Ridge Trail

Riding - Whetstone Ridge Trail is not maintained to a standard suitable for horseback riding

Photography - Photography opportunities are typical of this portion of the National Forest There are no outstanding vistas or natural features that would enhance photographic opportunities

Special Features:

What is the capability of the area to provide outdoor education and scientific study, both formal and informal, in a manner compatible with wilderness? Some opportunities exist for studies relating to natural processes in relatively undisturbed forest areas Such opportunities are typical of many other areas on the Pedlar Ranger District

Is there an abundant and varied wildlife population? Wildlife populations are typical of those found in undisturbed areas of the Blue Ridge Mountains

Manageability:

What are the characteristics of the surrounding area including ROS classification, adopted VQO, and present and planned uses? Sixty-five percent of the surrounding land is private The ROS on that portion of nearby National Forest land is primarily Semi-Primitive,Non-Motorized (SPNM), with some Roaded Natural (RN) The VQO assigned to adjacent lands varies from maximum modification to retention Detailed maps are available in the Forest Supervisor's Office in Harrisonburg, Virginia

Present and future development of adjoining private property for agricultural, residential, and recreational purposes could have a negatively impact of the area's wilderness values

Do boundary locations conflict with important existing or potential public uses outside the boundary that might result in demands to allow nonconforming structures and/or activities in the wilderness?

Much of the area is bordered by private lands In some cases, these lands might provide ready access for motorized vehicles

Is it possible to readily and accurately describe, establish, and recognize boundaries on the ground? YES

Do boundaries, where possible, conform with terrain or other features that constitute a barrier to prohibited use? No The boundaries along State Route 603 and Forest Road 104 provide ample opportunties for motorized access The same is true from adjacent private lands In some locations the steep terrain would limit access

Do boundaries, to the extent practicable, act as a shield to protect the wilderness environment inside the boundary from the *sights and sounds of civilization?* No, the boundaries will not shield the area from the sights and sounds of activities taking place on adjacent private land or public roads

Do boundaries provide adequate opportunity for access and traveler transfer facilities? Yes, access is available off State Route 603 and FDR 104

Availability

Describe other (non-wilderness) resource demands and uses. What current uses exist?

Recreation - Hiking and hunting are the primary recreational uses

Information on Wildlife Species, Populations, and Management Needs - The majority of the area is currently managed to feature bear Squirrel management is featured in a small area on the north end

Water Availability and Use - Water is available from intermittent and perrenila streams scattered across the area

Livestock Operations - NONE

Timber - Most of the area is in low quality and mature timber that could not be economically harvested Some portions of the area are quite steep and rocky There are no timber sale activities currently planned. Site indices average 50 to 60

Minerals - There are no outstanding rights The area has no known potential for oil and/or gas recovery

Cultural Resources - Some small prehistoric archaeological sites have been located in the area, primarily along the South Mountain Trail and Big Mary's Creek These sites are lithic scatters and are currently interpreted as resulting from debitage left over from activities performed in transient camps Evaluations for site significance have not been conducted Any flat terrain near a perennial source of water may contain additional sites that have not been recorded

The northern portion of this area contained a Post Road dating from the Nineteenth Century A mail carrier on horseback travelled this road delivering mail to several houses that are now house sites in the vicinity of Big Marys Creek The individual house sites may not be included within the roadless area The road runs from the stream to Whetstone Ridge No standing structures can be found in the area

Authorized and Potential Land Uses - Powerlines along Irish Creek Road and to the Nature Camp can be excluded from the area

Management Considerations, including Fire, Insects and Diseases, and Presence of Non-Federal Land - Due to successful fire suppression efforts by the National Forest, there is a considerable buildup of light and heavy fuels in the area Fire size would be related to existing weather conditions Due to the terrain and accessibility, suppression by hand would be difficult

Based in part on the results of egg mass surveys, defoliation and some mortality associated with Gypsy Moth is certain to occur in the area Salvage operations would not be considered practical under current practices due to the rugged terrain

There are no private inholdings

What outputs are currently produced or could be produced in the future? Dispersed recreation activities, primarily hunting and hiking (including backpacking), are expected to continue at existing levels

Conventional and cable logging methods are presently impractical, since development and removal costs would far exceed the timber values

Is the area located such that the need for increased water production and/or additional onsite storage is so vital that *installation or maintenance of improvements is an obvious and inevitable public necessity?* NO

Would wilderness designation seriously restrict or prevent the application of wildlife management measures of considerable magnitude and importance? NO

Is it a highly mineralized area of such strategic or economic importance and extent that restrictions or controls due to wilderness designation would not be in the public interest? NO

Does the area contain natural phenomena of such unique or outstanding nature that general public access and special development to facilitate public enjoyment should be available? NO

Is the land needed to meet clearly documented resource demands such as for timber, mineral production, or developed recreation? NO

Is the land committed through contractual agreements for use, purposes, or activities not in concert with wilderness requirements? NO

Needs

Other Wildernesses:

How far is it to the closest existing wilderness? Saint Marys Wilderness is located approximately two miles north of Adams Peak

What level of use currently exists in near-by existing wilderness? What trends exist in the use of these areas? As estimated 6,000 recreation visitor days of use were recorded in St Marys Wilderness in 1989 This is a significant amount of use that has resulted in serious impacts on the area's wilderness qualities and resources Campfire restrictions have been implemented along the St Marys River in an attempt to mitigate these impacts Trends indicate that use has been steaily increasing over time

Is the population in and around these areas increasing or decreasing? How quickly is it increasing or decreasing? Adams Peak is located in Rockbridge County which experienced a growth in population between 1980 and 1990 averaging 0 2 percent per year Its population increased from 17,911 to 18,205 over this period

In Amherst County to the east, the population increased from 29,122 to 29,360 over the same period In general, the population in the counties surrounding Adams Peak is increasing, as is the population in the state of Virginia

Non-wilderness Lands:

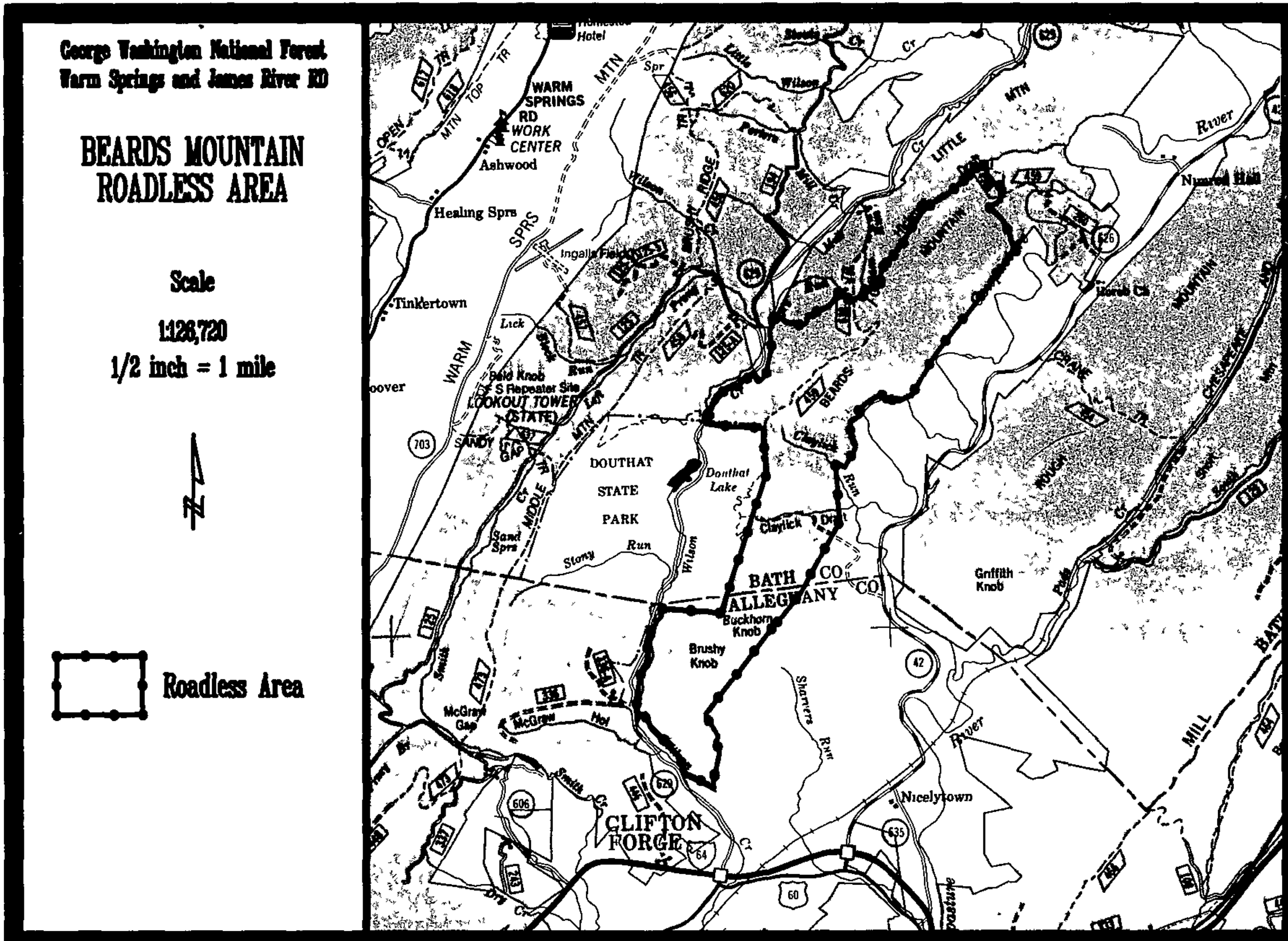
Are there opportunities for unconfined and primitive recreation experiences on nonwilderness areas in the vicinity? If so, where? There are numerous areas of National Forest within reasonable distance that are suitable and available for primitive recreation

Habitat:

Are there any biotic species in the area that are directly competing with increasing public use and development? There are no known competing concerns or conflicts An inventory of the area's flora and fauna has not been completed If an inventory of the area reveals the presence of sensitive species requiring active management, these activities could be restricted or precluded under a wilderness designation

Could these needs be provided for through means other than wilderness designation? The habitat needs of any sensitive species in the area could be provided for through designation of the area as a Special Management Area (SMA) They could also be provided for by allocating the area to a management prescription that would minimize human disturbance Again, no such species are know to exist in Adams Peak

Is there a need to provide a sanctuary for biotic species that cannot survive in less than primitive surroundings? This is unknown at the present time Studies and data collection are being completed by various scientific and interested groups/individuals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LOOKOUT TOWER (STATE)
DOUTHAT
STATE
PARK
Douthat Lake
Stony
Run
Wilson
BATH CO
ALLEGHANY CO
Buckhorn Knob
Brushy Knob
Griffith Knob
McGraw Gap
CLIFTON FORGE
Nicelytown
Nimrod Hall
Sharpers Run
River
BEARDS
LITTLE
MTN
WARM
SPRS
MIDDLE
MILL
Sand Sprs
Horse
CR
Cr
703
606
629
635
42
64
60
Smith
Claylick
Lick
Hotel

BEARDS MOUNTAIN ROADLESS AREA

I. DESCRIPTION

Acres· approximately 7,457

Location and vicinity Beards Mountain is located on the Warm Springs and James River Ranger Districts, George Washington National Forest about 1 mile north of Clifton Forge in Bath and Alleghany Counties, Virginia

Access, including roads and trails leading to the area The boundary can be accessed by the following roads Virginia Route 629 from Wilson Trailer Park in Allegany County north through Douthat State Park along the western boundary Portions of the western boundary extend to Virginia Route 629 The area can also be accessed through the Douthat State Park Forest Service Roads 361 and 361A provide direct vehicle access to the northern part of Beards Mountain Forest Service Road 361 is currently closed to public vehicle travel but does provide foot access There is no public access long the eastern boundary except for the foot bridge at the Walton tract adjacent to the northeastern end of Beards Mountain Beards Mountain trail and Gilliam Run Trail provides access to the top of Beards Mountain

General description of the area geography The Beards Mountain Roadless Area comprises most of Beards Mountain It is part of the Valley and Ridge Physiographic Province of Virginia Beards Mountain is bounded on the east by the Cowpasture River Valley and on the west by Wilson Creek Approximately half of the western boundary lies along the Douthat State Park Beards Mountain lies approximately one mile north of U S 64 Virginia Route 42 lies on the east side of the Cowpasture River (adjacent to the Rough Mountain Wilderness)

General description of the area topography Beards Mountain increases in elevation from north to south The highest elevation is 2,850 feet on a knob south of where the Gilliam Run Trail joins the Beards Mountain Trail Many of the knobs on the Douthat Park Boundary exceed 2,600 feet The lowest elevation is approximately 1,180 feet in a hollow next to Wilson Trailer Park

The eastern side of Beards Mountain contains the headwaters of a number of small streams that flow into the Cowpasture River including Claylick Draft, Claylick Run and Salt Hollow The western side of Beards Mountain contains the headwaters of a number of small streams that flow into Wilson Creek including Gilliam Run, Dry Lick Hollow and Polecat Hollow

General description of the area vegetation, including the ecosystem type Beards Mountain contains upland eastern hardwoods, mainly oaks Pitch pine, table mountain pine, and Virginia pine are found on the drier aspects and shale barrens Eastern Hemlocks and cove hardwoods are found on the moister sites Eastern white pine is found on most sites

Key attractions, if any, including sensitive wildlife and scenic landmarks. There are no specific key attractions within Beards Mountain The east face of Beards Mountain serves as a scenic backdrop for the western side of the Cowpasture River Valley as viewed from Virginia Route 42

II. INVENTORY

<u>Human Influence</u>

To what degree have humans and past and present human activity affected natural ecological processes and conditions? Present and past acitivities of man have had little effect on the ecological processes and conditions of Beards Mountain

To what degree is the area natural or natural appearing and free from disturbance? Except for small areas of recent timber cutting and road construction, Beards Mountain generally appears natural and free from disturbances The noise level from traffic sounds on Highway 42 and farming operations in the Cowpasture River Valley will create some disturbance especially on the east face of Beards Mountain

If the area ecological processes and/or natural appearance have been altered by past or present human activity, is the land regaining a natural, untrammeled appearance? Most of Beard Mountain is regaining a natural, untrammeled appearance

Does the existing or attainable National Forest System ownership pattern, both surface and subsurface, ensure perpetuation of identified wilderness value? The National Forest System owns all of the surface and subsurface resources in Beards Mountain

Is more than 15 percent of the area in non-native vegetation? NO

Improvements, Structures, and Nonconforming Uses

Are any of the following types of areas, features or nonconforming uses present? If so, where?

Areas with evidence of historic mining at least 50 years old (Do not include areas of significant current mineral activity): NONE

Areas under current mineral lease that contain a "no surface occupancy" stipulation: NONE

Areas under current mineral lease where the leasee has not exercised development and occupancy rights· NONE

Recreation improvements such as occupancy spots or minor hunting or outfitter camps. There are some primitive recreation occupancy spots along Virginia Route 629 north of Douthat State Park and along Forest Service Road 361 in Gilliam Run

Timber harvest areas where logging and prior road construction are or are not evident. *There were a number of timber sales* in Beards Mountain during the 1970s and 1980s The old Roses Run Sale on Claylick Run and Claylick Draft was completed in 1976 It had four regeneration areas, totaling 121 acres In addition a 56-acre area was regenerated in 1962 Temporary roads were used to log this sale and have been revegetated Three units of the Hickman Draft Sale are located at the north end of Beards Mountain They were regenerated in 1987 and were accessed by Forest Service Road 361 Interior temporary roads and skid trails have been revegetated A 70-acre clearcut joins the Douthat Park boundary on the north along Virginia Route 629 The area was regenerated in 1977 All interior roads were revegetated One 23-acre clearcut regenerated in 1979 lies in the Sawmill Hollow drainage off Forest *Service Road 361A A portion of a 16-acre clearcut on the Hickman Draft Sale Complex is located at the head of Hickman Draft This* area was regenerated in 1986 Most of these regeneration units are still evident One stand adjacent to the boundary of Douthat State Park off Virginia Route 629 is not evident

Cultural treatments involving plantations or plantings: Two of the stands in Claylick Draft area were planted to white pine

Private inholdings in the area. NONE

Dwellings on private inholdings· NONE

Nonconforming structures and improvements· NONE

Ground-return telephone lines: NONE

Watershed treatment areas. NONE

Roads. NONE

Can existing nonconforming uses be effectively mitigated or terminated through removal or rapid natural deterioration? NOT APPLICABLE

Are improvements in the area being affected by the forces of nature rather than humans, and are they disappearing or muted? The stands that were harvested during the 1970s and 1980s are being muted by the forces of nature.

III EVALUATION

Capability

Does the area contain the basic characteristics that make it suitable for wilderness designation without regard to its availability for or need as wilderness? Consider the following characteristics in analyzing the quality of the wilderness resource. If these characteristics are determined to be important, describe and refer to them.

Experiential benefits. Does the area provide the opportunity for solitude and serenity? Due to traffic noise from Virginia Routes 42 and 629, opportunities for solitude are limited

Challenge. Does the area offer visitors the opportunity to experience adventure, excitement, challenge, initiative, or self-reliance. Is access easy or difficult? Due to steep terrain and limited access, hiking in Beards Mountain would be a challenge

Outdoor Recreation Opportunities. What is the area capability for providing primitive and unconfined types of recreation including:

Camping - Beards Mountain offers very limited camping opportunities except along Virginia Route 629 and Forest Service Road 361

Hunting - Beards Mountain has good opportunities for hunting with limitations caused by lack of access and steep terrain

Fishing - NONE

Mountain climbing - There are moderate opportunities for mountain climbing on Beards Mountain

Ski touring - NONE

Canoeing - NONE

Boating - NONE

River Rafting - NONE

Backpacking - Beards Mountain offers good opportunities for backpacking

Hiking - Beards Mountain offers good opportunities for hiking

Riding - Beards Mountain moderate limited opportunities for horseback riding along existing trails

Photography - There are good opportunities for photography on the Cowpasture Valley side of Beards Mountain

Special Features

What is the area capability to provide outdoor education and scientific study, both formal and informal, in a manner compatible with wilderness? UNKNOWN

Is there an abundant and varied wildlife population? Beards Mountain supports bear, deer, squirel, grouse and turkey plus non-game species typical of the locale

Manageability.

What are the characteristics of the surrounding area including ROS classification, adopted VQO, and present and planned uses? The surrounding area is inventoried as either roaded natural or semi-primitive non-motorized ROS The visual quality objective for the surrounding area is generally modification and partial retention Most of the surrounding area is in private ownership

Do boundary locations conflict with important existing or potential public uses outside the boundary that might result in demands to allow nonconforming structures and/or activities in the wilderness? NONE KNOWN

Is it possible to readily and accurately describe, establish, and recognize boundaries on the ground? YES Most of the boundary is comprised of painted landlines The remainder of the boundary follows roads and terrain features

Do boundaries, where possible, conform with terrain or other features that constitute a barrier to prohibited use? NO

Do boundaries, to the extent practicable, act as a shield to protect the wilderness environment inside the boundary from the sights and sounds of civilization? NO

Do boundaries provide adequate opportunity for access and traveler transfer facilities? The boundary limits access to the northerwestern portion of Beards Mountain

Availability

Describe other (nonwilderness) resource demands and uses. What current uses exist?

Recreation: Beards Mountain is used for hiking, horseback riding, and hunting The amount of use is unknown

Information on wildlife species, populations, and management needs: Deer, turkey, and bear populations are normal for the ridge and valley province

Water availability and use. NONE

Livestock operations. NONE

Timber: According to stand records, Beards Mountain includes 8,091 acres of lands suitable for timber production

Minerals: There is no anticipated demand for leasing of federal minerals

Cultural resources. NONE KNOWN

Authorized and potential land uses: NONE

Management considerations including fire, insects and diseases, and presence of non-federal lands. In about 5 years, the gypsy moth will be causing defoliation and mortality in Beards Mountain. Public access is severely limited on the east side by private land and the Cowpasture River

What outputs are currently produced or could be produced in the future? Four stands of the proposed Slim Branch Timber Sale are located within Beards Mountain. Cutting units 5-8, totaling acres 65, are located within the proposed boundary

Is the area located such that the need for increased water production and/or additional onsite storage is so vital that installation or maintenance of improvements is an obvious and inevitable public necessity? NO

Would wilderness designation seriously restrict or prevent the application of wildlife and/or threatened and endangered plant or animal management measures of considerable magnitude and importance? NO

Is it a highly mineralized area of such strategic or economic importance and extent that restrictions or controls due to wilderness designation would not be in the public interest? NO

Does the area contain natural phenomena of such unique or outstanding nature that general public access and special development to facilitate public enjoyment should be available? NO

Is the land needed to meet clearly documented resource demands such as for timber, mineral production, or developed recreation? NO

Is the land committed through contractual agreements for use, purposes, or activities not in concert with wilderness requirements? NO

Needs

Other Wildernesses:

How far is it to the closest existing wilderness? The Rough Mountain Wilderness lies less than 1 mile to east, across the Cowpasture River Valley Rich Hole Wilderness lies about 6 miles to the east

What level of use currently exists in near-by existing wilderness? What trends exist in the use of these areas? Rough Mountain and Rich Hole Wildernesses recorded only 3,800 visitor days of use in 1989. This is a relatively low level of use

Is the population in and around these areas increasing or decreasing? How quickly is it increasing or decreasing? Beards Mountain is located primarily in Bath County with a small portion located in Alleghany County The populations in both of these counties decreased between 1980 and 1990

Studies of visitors to the St Marys wilderness on the Pedlar Ranger District have indicated that the visitors often travel up to 100 miles to get to the area In light of this, it is useful to look at the population of the state of Virginia and West Virginia Between 1980 and 1990, the population of the State of Virginia increased at an annual rate of 1 4 percent while the population for the state of West Virginia decreased at an annual rate of 0 4 percent

Nonwilderness Lands.

Are there opportunities for unconfined and primitive recreation experiences on nonwilderness areas in the vicinity? If so, where? There are many acres of National Forest on Pads Creek and west of Virginia Route 629

Habitat.

Are there any biotic species in the area that are directly competing with increasing public use and development? A survey for rare flora and fauna in Beards Mountain has not been completed At this time, there are no known biotic species in Beards Mountain that are directly competing with increasing public use and development

Could their needs be provided for through means other than wilderness designation? NOT APPLICABLE

Is there a need to provide a sanctuary for biotic species that cannot survive in less than primitive surroundings? There is not a need to provide a sanctuary for biotic species that cannot survive in less than primitive surroundings

George Washington National Forest
Lee Ranger District

BIG SCHLOSS ROADLESS AREA

Scale

1:126,720
1/2 inch = 1 mile

Roadless Area

Final

Deleted between Draft and Final

BIG SCHLOSS ROADLESS AREA

I. DESCRIPTION

Acres: approximately 20,755

Location and vicinity. Big Schloss is located on the Lee River Ranger District, George Washington National Forest about 8 miles west of Woodstock, Virginia in Shenandoah and Fredrick Counties, Virginia and Hardy County, West Virginia

7,550 acres of this roadless area lie within the Big Schloss Special Management Area (identified in the *Land and Resource Management Plan for the George Washington National Forest*)

Describe access to the area including roads and trails leading to the area. The boundary can be accessed by the following roads Virginia Route 675, West Virginia Routes 5/1 and 23/10 and Forest Roads 88, 92, 371 and 85. These roads are open to the public all year.

Trails along the main ridgetops are linked via sidetrails to public roads and trailhead parking lots around the perimeter of Big Schloss Trails include the Big Blue Trail (1013), Stony Creek Trail (571), Little Sluice Mountain Trail (401) and Mill Mountain Trail (1004).

General description of the area geography. Big Schloss lies within the Ridge and Valley Physiographic Province of Virginia and West Virginia It contains narrow mountain ridges with parallel drainages running in a southwest to northeast alignment Big Schloss contains Halfmoon Mountain, Little Sluice Mountain, North Mountain, Paddy Mountain and the southern extension of Great North Mountain. Prominent points include Big Schloss, Little Schloss, Sugar Knob and Three High Heads Upper reaches of Stony Creek, Paddy Run, Cove Run and Waites Run are also included

General description of the area topography. Elevations range from approximately 1,600 feet at a number of places near the boundary to 3,293 feet at the old FAA beacon site, Slopes vary from moderate to very steep and are dissected by numerous small streams Ridgetops are capped with sandstone which outcrops at Big Schloss, Little Schloss, Halfmoon and a series of white rock cliffs along the east facing slopes of Paddy Mountain

General description of the area vegetation, including the ecosystem type. Big Schloss is entirely forested Defoliation by the gypsy moth for the past 3 years has created many patches of mortality in the oak overstory

Upper slope soils are thin with many rock outcroppings and cliffs Blockfields are common Vegetation on these sites includes bear oak, laurel, and mixed stands of gnarly chesnut oak and Table Mountain and pitch pine Due to past charcoaling, tanbarking, and recurrent burning, the broad ridgetops and "flats" generally contain stands of chestnut and scarlet oak Lower slopes and coves contain richer sites with northern red oak in the hollows, coves, and north and east aspects

Understory vegetation varies with aspect and moisture regime Riparian vegetation exists along perennial and larger intermittent streams The driest sites contain fetterbush, scrub oaks, and yellow and white pine saplings Intermediate sites contain pine and a lesser amount of hardwood saplings, understory tree species such as dogwood and black gum, laurel, and sparse amounts of herbaceous plants

Key attractions, if any, including sensitive wildlife and scenic landmarks. Sandstone outcroppings at Big Schloss and the trail and trailhead at the Wolf Gap recreation area attract most users Little Schloss and Halfmoon Mountain, as well as the smaller outcrops along the east facing slope of Paddy Mountain, attract some visitors Three High Heads is also a prominent landmark that receives low use due to lack of trail access

The Big Blue Trail, a 250 mile trail connecting the Applachian Trail (AT) in Shenandoah Park into the AT again in Pennsylvania, traverses Big Schloss It generally runs from Cedar Creek along the top around Sugar Knob, down Pond Run, and then along the top of Great North Mountain to the boundary

The headwaters and upper reach of Little Stony Creek lie in Big Schloss This stream is a special regulation native trout stream

II. INVENTORY

Human Influence

To what degree have humans and past and present human activity affected natural ecological processes and conditions? Most of Big Schloss was cut over for charcoal to fuel VanBuren, Columbia and Crackwhip Furnances and for tanbark There are a number of old roads and skidtrails dating from this period The majority of the forested lands are approximately 80 years old Big Schloss burned frequently prior to government acquisition

There has been recent road construction and timber harvesting in Vances Cove, Wilson Cove, along the lower slopes of Paddy and Little Sluice Mountains, and along the roads used as a boundary on the south - Forest Service Roads 88 and 92

To what degree is the area natural or natural appearing and free from disturbance? Big Scholoss appears to the average visitor as *quite natural and free from disturbance by man Little evidence of turn-of-the-century activities on ecological processes is* noticeable to the average visitor Recent activities have had little impact on ecological processes and conditions in Big Schloss

The sight and sound of man's activities are evident from most of Big Schloss due to views of adjoining private property and the relative short distances from Forest Service and State roads.

If the area ecological processes and/or natural appearance have been altered by past or present human activity, is the land regaining a natural, untrammeled appearance? The central area has a natural and untrammeled appearance to the average visitor The Little Sluice road/trail could be obliterated. The old FAA beacon and powerline have been abandoned and are now being put up for salvage bidding Only in Vances Cove, Wilson Cove, along the lower slopes of Paddy and Little Sluice Mountains, and along Forest Service Roads 88 and 92 is there any appearance of recent management activity

Does the existing or attainable National Forest System ownership pattern, both surface and subsurface, ensure perpetuation of identified wilderness value? The National Forest System owns all of the surface of this area except for a 7-acre tract on Waites Run.

There are two "tracts" of outstanding and reserved minerals in the lower half of Big Schloss There is a tract of outstanding minerals *in the Halfmoon Mountain and Mill Mountain area and a tract of reserved minerals in the Stoney Creek and Little Sluice Mountain area* Approximately 7,100 acres of Big Schloss contain either outstanding or reserved mineral rights.

Is more than 15 percent of the area in non-native vegetation? *NO*

Improvements, Structures, and Nonconforming Uses

Are any of the following types of areas, features or nonconforming uses present? If so, where?

Areas with evidence of historic mining at least 50 years old (Do not include areas of significant current mineral activity): *There* are some old open cut mines in the Cedar Creek area These were used to extract iron ore There are also numerous charcoal hearths scattered throughout the area All are covered with leaf litter and vegetation and do not constitute a negative impact on the wilderness resource

Areas under current mineral lease that contain a "no surface occupancy" stipulation: NONE

Areas under current mineral lease where the leasee has not exercised development and occupancy rights: There is a 124-acre tract under oil and gas lease on the northwest side of Racer Camp Hollow This lease is presently the only active lease on the Lee Ranger District It expires on December 1, 1997 The leasee has not exercised development or occupancy rights

Recreation improvements such as occupancy spots or minor hunting or outfitter camps: There are no outfitter camps There are some primitive dispersed camping locations in the area

Sugar Knob cabin, an historic site, is located in the area near the top of Sugar Knob at the head of Little Stony Creek It was a cabin for the lookouts that manned Halfmoon and Paddy Mountain lookouts The cabin is made of native stone and is presently under special use permit to the Potomac Appalachian Trail Club The Club operates the cabin on a reservation system for trail users A rock foundation is still visible at Halfmoon, while only old rotted boards and rusty roofing is left at the Paddy Gap site Several old grounded phoneline insulators can be seen high in the trees along the trails that connected the lookout points to the valleys and local residents

There is a manmade trail bridge at Big Schloss There is a long standing tradition of hunting camps along the Little Sluice road/trail

Timber harvest areas where logging and prior road construction are or are not evident. Some of the old charcoal, tanbark, and log skidtrails and roads are evident to the keen observer Most are overgrown and do not detract from the primitive experience Recent timber harvesting and road construction in Vances Cove, Wilson Cove, along the lower slopes of Paddy and Little Sluice Mountains, and along Forest Service Roads 88 and 92 are still quite evident

Cultural treatments involving plantations or plantings: There are several clearcuts within the area made in the past 25 years that have been site prepared by chainsaws for natural regeneration to oak

Private inholdings in the area: There is a 7-acre private inholding on Waites Run Some additional private property in Wilson Cove has been excluded from the roadless area by a boundary adjustment to create an inclusion The fact remains, however, that there is a large tract of private land that lies within the heart of this roadless area.

Dwellings on private inholdings: There are two houses used as part-time recreation residences in the large inclusion in Wilson Cove Technically, these are not part of the roadless area

Nonconforming structures and improvements· The only nonconforming structure and/or improvement is the Sugar Knob cabin

Ground-return telephone lines NONE

Watershed treatment areas: NONE

Roads. The old wagon road up Little Sluice Mountain to Mill Mountain, FDR 1719, is open to motorized traffic and also serves as a trail location There are numerous roads open to public motorized traffic that are used as a boundary for the extended area and many short spurs off the boundary roads into the area These roads include FDR 1725 (two segments), whis is a D-level road These roads are approximately 7 miles long Some of these roads could be excluded from the area through minor boundary adjustments

Can existing nonconforming uses be effectively mitigated or terminated through removal or rapid natural deterioration? A small adjustment to the inclusion around Wilson Cove could also remove the 7-acre private tract on Waites Run

Although it is possible to remove the Sugar Knob cabin, its status as a historic site makes such action questionable The existing roads could be obliterated or permitted to deteriorate naturally The Little Sluice route could be changed into a non-motorized trail and modified to prevent motorized traffic There will, however, be long-term trespass problems because of the established history of motorized use

Are improvements in the area being affected by the forces of nature rather than humans, and are they disappearing or muted? Both the Sugar Knob cabin and the Little Sluice road/trail are being maintained

III. EVALUATION

Capability

Does the area contain the basic characteristics that make it suitable for wilderness designation without regard to its availability for or need as wilderness? Consider the following characteristics in analyzing the quality of the wilderness resource If these characteristics are determined to be important, describe and refer to them.

Experiential benefits Does the area provide the opportunity for solitude and serenity? There is a chance for solitude and serenity in the center of the area Because it is small and elongated lying along the top of a mountain, the sights and sounds of man can not be excluded from the majority of the area

Challenge Does the area offer visitors the opportunity to experience adventure, excitement, challenge, initiative, or self-reliance. Is access easy or difficult? Big Schloss is easily accessible by trails Its size offers some degree of challenge, but any sense of adventure and excitement and feelings of being self-reliant and using one's initiative are limited by the sights and sounds of civilization

Outdoor Recreation Opportunities. What is the area capability for providing primitive and unconfined types of recreation including:

Camping. Big Schloss has many opportunities for primitive camping

Hunting· Big Schloss is popular for hunting deer, bear, and turkey

Fishing: There are some fishing opportunities in Little Stony Creek

Mountain Climbing: There has been some repelling done on Big Schloss

Ski Touring· NONE

Canoeing: NONE

Boating· NONE

River Rafting· NONE

Backpacking· There is an excellent trail system in place

Hiking. There is an excellent trail system in place

Riding: Big Schloss is used for horseback and mountain bike riding

Photography. There are good opportunities

Special Features·

What is the area capability to provide outdoor education and scientific study, both formal and informal, in a manner compatible with wilderness? Big Schloss is close to large numbers of people and is easily accessed by road and trail

Is there an abundant and varied wildlife population? Big Schloss supports bear, deer, squirel, grouse and turkey plus non-game species typical of the locale

Manageability·

What are the characteristics of the surrounding area including ROS classification, adopted VQO, and present and planned uses? The surrounding area is inventoried as either roaded natural or semi-primitive non-motorized ROS The visual quality objective for the surrounding area is generally modification except for the Blue Trail which has a partial retention visual quality objective

Do boundary locations conflict with important existing or potential public uses outside the boundary that might result in demands to allow nonconforming structures and/or activities in the wilderness? None known There are several places along the boundary between private and National Forest where private structures are located right on the property line

Is it possible to readily and accurately describe, establish, and recognize boundaries on the ground? Portions of the boundary paralled roads and can be easily located Other portions parallel the main ridges and could not be easily located and marked

Do boundaries, where possible, conform with terrain or other features that constitute a barrier to prohibited use? Portions of the boundary, particularly along Great North Mountain and Paddy Mountain, lie along steeper terrain which forms some barrier to prohibited use In many areas, however, the boundary is defined by open roads The gentle terrain along the proposed boundary roads does not form a barrier to prohibited use.

Do boundaries, to the extent practicable, act as a shield to protect the wilderness environment inside the boundary from the sights and sounds of civilization? Big Schloss lies along a series of parallel main ridges, so the sights and sounds of civilization cannot be excluded from many portions of the area

Do boundaries provide adequate opportunity for access and traveler transfer facilities? YES The boundary excludes the major trailheads and access roads excepting a couple in along the east boundary These can be excluded through minor boundary adjustments and a more accurate location of the boundary along some of the system roads that are currently shown as being within the area

Availability

Describe other (nonwilderness) resource demands and uses

Recreation - Big Schloss is now used for hiking, horseback riding, mountainbike riding, and hunting It is heavily hunted for deer, bear, turkey, and small game The Sugar Knob cabin is in high demand There is established use of 4x4 vehicles on the Little Sluice road to Mill Mountain including the hunting season when this route is also used for camping by many of the hunters The area located along the main roads, used as boundaries, and within Wilson and Vances Coves have been historically used for personal wood cutting, hunting, and mushroom gathering

Information on Wildlife Species, Populations, and Management Needs - Deer, turkey, and bear populations are normal in the area The terrain and vegetation do not favor turkey within the SMA, however the land on the lower slopes of the expanded area is favorable turkey habitat

Water Availability and Use - Limited

Livestock Operations - NONE

Timber - According to stand records, Big Schloss includes lands suitable for timber production along the main roads used for boundaries and within Wilson and Vances Coves and Trout Run

Minerals - There is one active mineral lease in Big Schloss There is no anticipated demand for additional leasing of federal minerals Although mineral potential is considered low, private mineral owners may seek to exercise their development rights

There are approximately 7,000 acres in the area where the mineral rights are reserved or outstanding

Cultural Resources - There are no known significant archaelogical sites within Big Schloss The steep and rugged terrain would have contributed to this area being an unfavorable locale for prehistoric occupation The floodplains and terraces along the major streams, particularly Waites Run, Cove Run, Paddy Run, and Little Stony Creek, offer the best potential for the discovery of prehistoric sites Additional potential prehistoric site locales would include flatter terrain near springs

Sugar Knob cabin and the two lookout sites were mentioned earlier There was a historic cabin called Hunters Shanty in the Little Stony drainage along the Little Sluice road at the point shown as "camp" near a spring on the USGS quad map A modern cabin built next to the historic site was removed in the early 1980s There are remains of a historic mountain farm up the Little Stony drainage This was known as the Miller place

Authorized and Potential Land Uses - There are no permanent occupancy type uses authorized now except for the Sugar Knob cabin

Management Considerations Including Fire, Insects and Diseases, and Presence of Non-Federal Lands The gypsy moth has defoilated the area several years now and will do so for another 1 to 2 years before their population crashes

What outputs are currently produced or could be produced in the future? Big Schloss presently provides good bear and turkey habitat that could be enhanced through habitat manipulation Portions of Big Schloss have been actively managed for timber and wildlife habitat and have been used for personal wood cutting

The lower slopes, especially along the major boundary roads, are suitable for timber management As these lands are already roaded, they could be managed for timber in a manner that would reduce the Forest's below-cost sale program

Is the area located such that the need for increased water production and/or additional onsite storage is so vital that installation or maintenance of improvements is an obvious and inevitable public necessity? NO

Would wilderness designation seriously restrict or prevent the application of wildlife and/or threatened and endangered plant or animal management measures of considerable magnitude and importance? NO

Is it a highly mineralized area of such strategic or economic importance and extent that restrictions or controls due to wilderness designation would not be in the public interest? NO

Does the area contain natural phenomena of such unique or outstanding nature that general public access and special development to facilitate public enjoyment should be available? NO

Is the land needed to meet clearly documented resource demands such as for timber, mineral production, or developed recreation? NO

Is the land committed through contractual agreements for use, purposes, or activities not in concert with wilderness requirements? Some of the land included within the boundary have timber sales presently under contract

Need

Other Wildernesses.

How far is it to the closest existing wilderness? There are 82,260 acres of wilderness in Shenandoah National Park The closest of these existing wilderness areas is about 23 miles to the east of this area

What level of use currently exists in near-by existing wilderness? What trends exist in the use of these areas? The wilderness areas in the Shenandoah National Park recieve high use and the trend is steady since 1981 according to SNP officials

Is the population in and around these areas increasing or decreasing? How quickly is it increasing or decreasing? The population is increasing moderately in the local area The regional area, which includes the D C metro area, is increasing at a moderate to high rate Much of the recreation use in the Big Schloss area originates from the Washington, D C area

Studies of visitors to the St Marys wilderness on the Pedlar Ranger District have indicated that the visitors often travel up to 100 miles to get to the area. In light of this, it is useful to look at the population of the state of Virginia and West Virginia Between 1980 and 1990, the population of the State of Virginia increased at an annual rate of 1 4 percent while the population for the state of West Virginia decreased at an annual rate of 0 4 percent

Nonwilderness Lands

Are there opportunities for unconfined and primitive recreation experiences on nonwilderness areas in the vicinity? If so, where? There are many acres of National Forest that join Big Schloss on the north and the south where primitive recreation can be enjoyed Shenandoah National Park and the Massanutten Mountains of the Lee District lie to the east and also provide these opportunities

Habitat.

Are there any biotic species in the area that are directly competing with increasing public use and development? Peregrine falcons were reintroduced into Big Schloss in 1988 and 1989 There is a good chance that they will attempt to nest on Big Schloss in future years

A survey for rare flora and fauna in Big Schloss has not been completed

Could their needs be provided for through means other than wilderness designation? YES

Is there a need to provide a sanctuary for biotic species that cannot survive in less than primitive surroundings? Peregrine falcons can survive in less than primitive surroundings

George Washington National Forest
Deerfield Ranger District

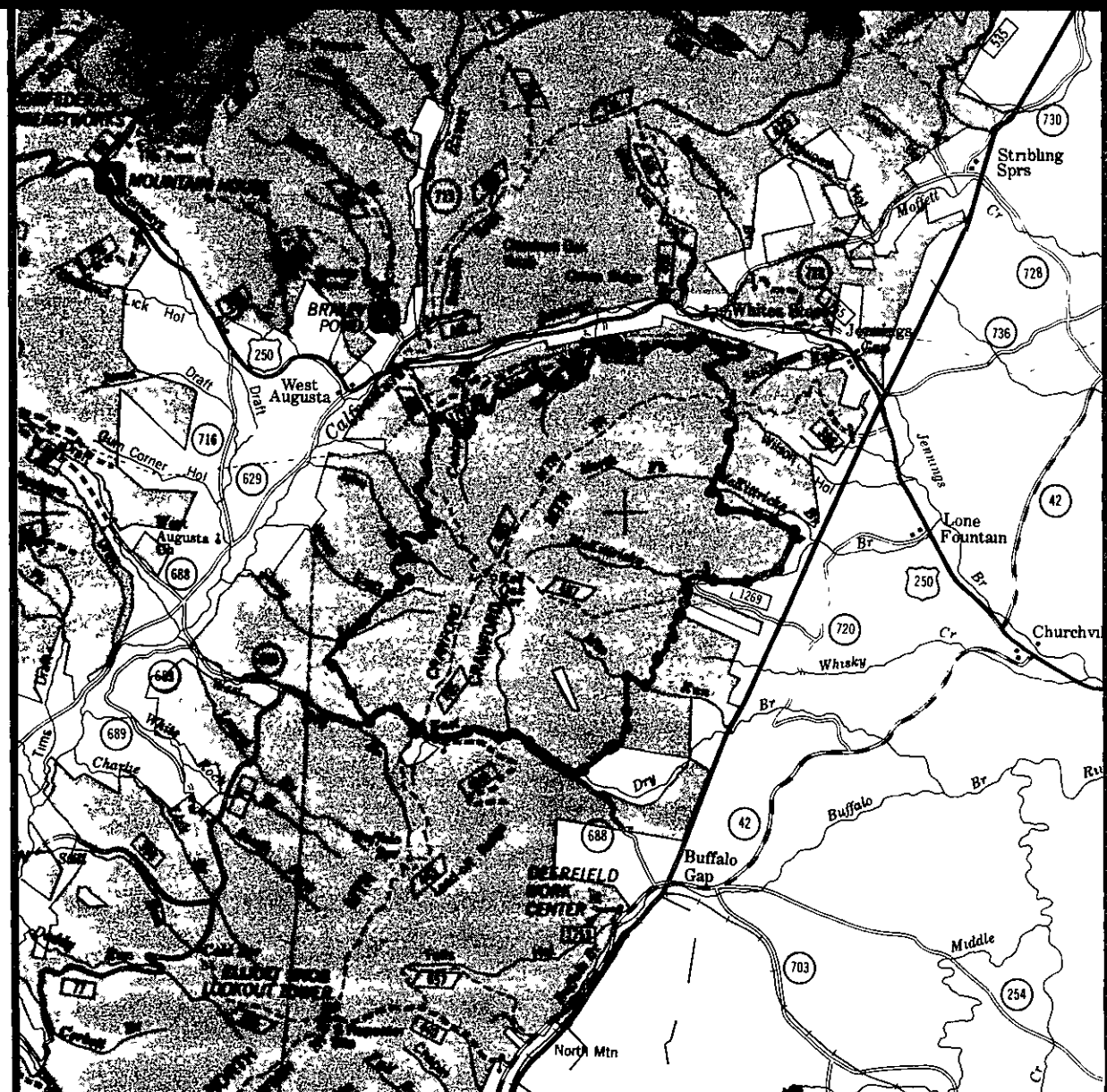
CRAWFORD MOUNTAIN ROADLESS AREA

Scale

1:126,720
1/2 inch = 1 mile

N

Roadless Area



CRAWFORD MOUNTAIN ROADLESS AREA

I DESCRIPTION

Acres. approximately 9,868

Location and vicinity. Crawford Mountain is located on the Deerfield Ranger District, George Washington National Forest about 15 miles northwest of Staunton, Virginia in western Augusta County, Virginia

Describe access to the area including roads and trails leading to the area Crawford Mountain is accessible on the north side by U S 250, on the west by State Route 629 and on the south by State Route 688

The Crawford Mountain Trail, accessed from State Route 688, runs for 7 8 miles through the center of the area Crawford Knob Trail runs 3 2 miles up the southeast slope of Crawford Mountain and connects with Chimney Hollow Trail which runs in a northwest direction for 3 2 miles to U S 250

General description of the area geography Crawford Mountain lies within the Allegheny Range of the Appalachian Mountain Range It is within the Ridge and Valley Physiographic Province of Virginia

General description of the area topography. The Crawford Mountain Roadless Area occupies both sides of Crawford Mountain, which is oriented northeast-southwest Elevations range from 1,660 feet to 3,728 feet on Crawford Knob

General description of the area vegetation, including the ecosystem type The vegetation is typical of the Eastern deciduous forests of the Allegheny Mountains Overstory species include table mountain pine on the very high and dry ridges, northern red oak, chestnut oak, and basswood in the upper coves with chestnut oak on the ridges, yellow birch and black birch on some of the highest moist ridges, and scarlet oak, chestnut oak or pitch pine-table mountain pine on the ridges and lower slopes, and black, red, white oaks in the hollows.

Understory composition on the southerly aspects typically have a mixture of laurel, bear oak, black gum and serviceberry Other areas have dogwood, sassafras, maple and gum

Key attractions, if any, including sensitive wildlife and scenic landmarks Crawford Mountain is considered to be one of the three best black bear habitats in Virginia outside of the Shenandoah National Park

There are two old mine sites along State Route 688 This rugged area is characterized by large boulders, rock ledges and several small, but interesting, waterfalls. In the drain there are also several large hemlock, white pine, yellow poplar and oak trees

II. INVENTORY

Human Influence

To what degree have humans and past and present human activity affected natural ecological processes and conditions? There is evidence of minor human impact This area was logged about 60 years ago when merchantable timber up to the 2,100 to 2,400 feet contour interval was harvested It was again logged after the Forest Service assumed ownership and as the American Chestnut was dying Many of the roads of this former logging activity are still evident Some of the roads built up the hollows are still in use In the past 15 years, the Forest Service has harvested five clearcuts along the edge of Crawford Mountain

To what degree is the area natural or natural appearing and free from disturbance? Crawford Mountain exists in a natural state with abundant plant and wildlife species represented Modern man's impact is not evident deep within the area, but is concentrated on the south perimeter There are five small wildlife openings on the top of Crawford Mountain near Red Oak Spring There are two man-made waterholes in this area and two developed springs

Several clearcuts along the fringes and within the area date to the late 70s and 80s with some just outside the area less than five years of age

If the area ecological processes and/or natural appearance have been altered by past or present human activity, is the land regaining a natural, untrammeled appearance? Areas where timber was harvested in recent years are being reclaimed by a natural progression of ecological forces The former exploratory logging roads have experienced natural aging processes They occupy small

specific sites and are not evident to the typical visitor Most of the area has been undisturbed by man's planned activities for over 15 years and is generally considered to have returned to its natural state in those cases of intrusion

Does the existing or attainable National Forest System ownership pattern, both surface and subsurface, ensure perpetuation of identified wilderness value? The Federal Government owns all surface and mineral rights for Crawford Mountain with the exception of a 30 6-acre tract of private land in the southeastern portion of the area which does not have access to it There are no improvements on the tract which has remained in the Crawford family since 1796

Is more than 15 percent of the area in non-native vegetation? NO

Improvements, Structures, and Nonconforming Uses

Are any of the following types of areas, features or nonconforming uses present? If so, where?

Areas with evidence of historic mining at least 50 years old (Do not include areas of significant current mineral activity): There are two old mine sites along State Route 688

Areas under current mineral lease that contain a "no surface occupancy" stipulation: NONE

Areas under current mineral lease where the leasee has not exercised development and occupancy rights. NONE

Recreation improvements such as occupancy spots or minor hunting or outfitter camps. NONE

Timber harvest areas where logging and prior road construction are or are not evident There are several clearcuts within Crawford Mountain dating back to the late 70s and 80s

Cultural treatments involving plantations or plantings· Two of the small wildlife openings have autumn olives in them

Private inholdings in the area· There is a 30 6-acre tract of private property in the southeastern portion of Crawford Mountain

Dwellings on private inholdings NONE

Nonconforming structures and improvements· NONE

Ground-return telephone lines· NONE

Watershed treatment areas· NONE

Roads There are at least eleven old woods roads running up the drainages in Crawford Mountain that are still in use by off-highway vehicles

Can existing nonconforming uses be effectively mitigated or terminated through removal or rapid natural deterioration? The existing nonconforming uses have naturally deteriorated to such a stage that they are not prominent The old woods roads need to be effectively closed to ATV traffic to allow them to naturally revegetate

Mitigation of the private inholding may be possible through purchase or exchange

Are improvements in the area being affected by the forces of nature rather than humans, and are they disappearing or muted? NONE

III. EVALUATION

Capability

Does the area contain the basic characteristics that make it suitable for wilderness designation without regard to its availability for or need as wilderness? Consider the following characteristics in analyzing the quality of the wilderness resource. If these characteristics are determined to be important, describe and refer to them

Experiential benefits Does the area provide the opportunity for solitude and serenity? Limited trails, steep terrain and low visitation provide opportunities for solitude Traffic noise may be evident on the north side and from State Route 250

Challenge Does the area offer visitors the opportunity to experience adventure, excitement, challenge, initiative, or self-reliance. Is access easy or difficult? Crawford Mountain is readily accessible by a system of hiking trails The area does, however, offer opportunities for primitive recreation in a natural setting

Outdoor Recreation Opportunities What is the area capability for providing primitive and unconfined types of recreation including

Camping - a limited amount of dispersed camping within Crawford Mountain There is a significant amount of camping by hunters

Hunting - the area is popular for hunting

Fishing - Most of the drainages in the area are classified as insufficient to support fisheries The drainages on the north side drain into the Calfpasture River which is classified as a cool water fishery

Mountain Climbing - NONE

Ski Touring - NONE

Canoeing - NONE

Boating - NONE

River Rafting - NONE

Backpacking - there are opportunities for backpacking in a primitive setting

Hiking - there are opportunities for hiking in a primitive setting

Riding - there is some horseback riding on the fringes of the area

Photography - there are good opportunities

Special Features

What is the area capability to provide outdoor education and scientific study, both formal and informal, in a manner compatible with wilderness? An absence of planned human activity in the area also offers an opportunity for ecological study focusing on *vegetation, wildlife and watershed*

Is there an abundant and varied wildlife population? Crawford Mountain contains an abundant and varied wildlife population typical of the Alleghany Mountains in the state of Virginia

Manageability:

What are the characteristics of the surrounding area including ROS classification, adopted VQO, and present and planned uses? The ROS for the surrounding National Forest land is RN (Roaded Natural) The VQO is Modification in the surrounding area of National Forest

Do boundary locations conflict with important existing or potential public uses outside the boundary that might result in demands to allow nonconforming structures and/or activities in the wilderness? The private property that surrounds Crawford Mountain, but does not adjoin it, is a combination of private homes and farm land Crawford Mountain has had a history of illegal ATV use eminating from adjoining private lands

Is it possible to readily and accurately describe, establish, and recognize boundaries on the ground? Boundaries defining Crawford Mountain consist of State Route 688 as the southern boundary and Forest Service Roads 1746 and 1761 1 defining the northern boundary The remainder of the boundary is defined by contour lines Since the northern and southern boundaries parallel roads, they can be easily recognized on the ground The remainder of the boundary would need to be surveyed and posted This would be a costly and time consuming project

Do boundaries, where possible, conform with terrain or other features that constitute a barrier to prohibited use? NO

Do boundaries, to the extent practicable, act as a shield to protect the wilderness environment inside the boundary from the sights and sounds of civilization? The eastern boundary has been located away from private property in order to provide a buffer between it and the development that is occuring on the private land The western boundary is also located away from private property, providing a buffer between the developments on the private land The north and south boundaries are located on roads which do not shield the area from the sights and sounds of man

Do boundaries provide adequate opportunity for access and traveler transfer facilities? YES

Availability

Describe other (nonwilderness) resource demands and uses

Recreation - Public use of Crawford Mountain consists of dispersed recreation activities including hunting, hiking and backpacking This use occurs primarily on a trail network consisting of Crawford Mountain Trail (7 8 miles), Chimney Hollow Trail (3 5 miles), and the Crawford Knob Trail (3 2 miles) Total recreational use totals approximately 1,500 to 2,500 visitor days per year

Information on Wildlife Species, Populations, and Management Needs - Crawford Mountain supports deer, bear, turkey, squirrel and nongame species of birds and animals Populations of these species are average relative to other mountainous areas on the Forest

Water Availability and Use - Water is scarce at the higher elevations

Livestock Operations - NONE

Timber - NONE

Minerals - NONE

Cultural Resources - The relatively dry, steep, rugged terrain found within the Crawford Mountain Area would not have offered prehistoric or historic populations a choice area to inhabit One would expect to find little evidence of occupation There is one possible area where prehistoric occupation lies along the crest of Crawford Mountain Flat terrain can be found within several saddles and on fairly flat ridges and ridge spurs Water would become the limiting factor for occupation of this area If a perennial water source was present, then prehistoric populations may have used this area for brief encampments

During the Civil War, this area did play a brief role in the events leading up to the Battle of McDowell in 1862 Jedediah Hotchkiss rode out Crawford Mountain to spy on Union forces camped along Jennings Branch A rear guard of Confederate soldiers camped near Dry Branch Gap on May 7, 1862 This was reported in a book entitled *Make Me a Map of the Valley* written by Jedediah Hotchkiss

Authorized and Potential Land Uses - NONE

Management Considerations Including Fire, Insects and Diseases, and Presence of Non-Federal Lands - Fires have occurred within the area over the years but have done little damage within the last 50+ years Some of the area's timber is dying due to old age and oak dieback is very prevalent in the oak stands The area is just ahead of the advancing Gypsy Moth front and defoliation is expected to occur in the near future

What outputs are currently produced or could be produced in the future? Crawford Mountain offers opportunities for dispersed recreation use, predominately hiking and hunting

Based on stand records, approximately 72 percent of Crawford Mountain is suitable for timber production There is a planned timber sale in the West Dry Branch vicinity which includes some development in the southwestern corner of the Crawford Mountain Roadless Area Five cutting units and over two miles of road construction would be within the roadless area

Is the area located such that the need for increased water production and/or additional onsite storage is so vital that installation or maintenance of improvements is an obvious and inevitable public necessity? NO

Would wilderness designation seriously restrict or prevent the application of wildlife and/or threatened and endangered plant or animal management measures of considerable magnitude and importance? NO

Is it a highly mineralized area of such strategic or economic importance and extent that restrictions or controls due to wilderness designation would not be in the public interest? NO

Does the area contain natural phenomena of such unique or outstanding nature that general public access and special development to facilitate public enjoyment should be available? NO

Is the land needed to meet clearly documented resource demands such as for timber, mineral production, or developed recreation? NO

Is the land committed through contractual agreements for use, purposes, or activities not in concert with wilderness requirements? NO

Need

Other Wildernesses

How far is it to the closest existing wilderness? Ramseys Draft Wilderness (6,519 acres) is located about 20 miles northwest of *Staunton and about six miles northwest along State Route 250 from Crawford Mountain Ramseys Draft is mostly in a large drainage* that has a different forest type than what is found on Crawford Mountain. Wilderness use has been increasing in Ramseys Draft Wilderness.

What level of use currently exists in near-by existing wilderness? What trends exist in the use of these areas? The closest existing wilderness is Ramseys Draft According to Recreation Information Management (RIM) use records, there were 3,000 visitor days of recreation recorded in Ramseys Draft in 1989 Trends indicate that use is increasing in the area over time This is a significant *amount of use in the area and has started to negatively impact the area wilderness qualities and resources*

Is the population in and around these areas increasing or decreasing? How quickly is it increasing or decreasing? Crawford Mountain is located in Augusta County, Virginia where the population increased from 53,732 to 56,315 between 1980 and 1990 The counties surrounding Augusta County on the west and south all experienced a slight decline in population over the same period of time Those to the east and north all grew at a modest rate between 1980 and 1990.

Studies of visitors to the St Marys wilderness on the Pedlar Ranger District have indicated that the visitors often travel up to 100 miles to get to the area. In light of this, it is useful to look at the population of the state of Virginia and West Virginia Between 1980 and 1990, the population of the State of Virginia increased at an annual rate of 1 4 percent while the population for the state of West Virginia decreased at an annual rate of 0 4 percent

Nonwilderness Lands·

Are there opportunities for unconfined and primitive recreation experiences on nonwilderness areas in the vicinity? If so, where? Little North Mountain Wildlife Management Area (17,538 acres) is located near the northeast corner of the area This area is *managed by the Virginia Department of Game and Inland Fisheries*

Many acres of National Forest land, suitable and available for primitive recreation, are within a reasonable range of Crawford Mountain.

Habitat:

Are there any biotic species in the area that are directly competing with increasing public use and development? *There are* no known biotic species in the area that are directly competing with increasing public use and development

Could their needs be provided for through means other than wilderness designation? YES

Is there a need to provide a sanctuary for biotic species that cannot survive in less than primitive surroundings? There is not a need to provide a sanctuary for biotic species that cannot survive in less than primitive surroundings

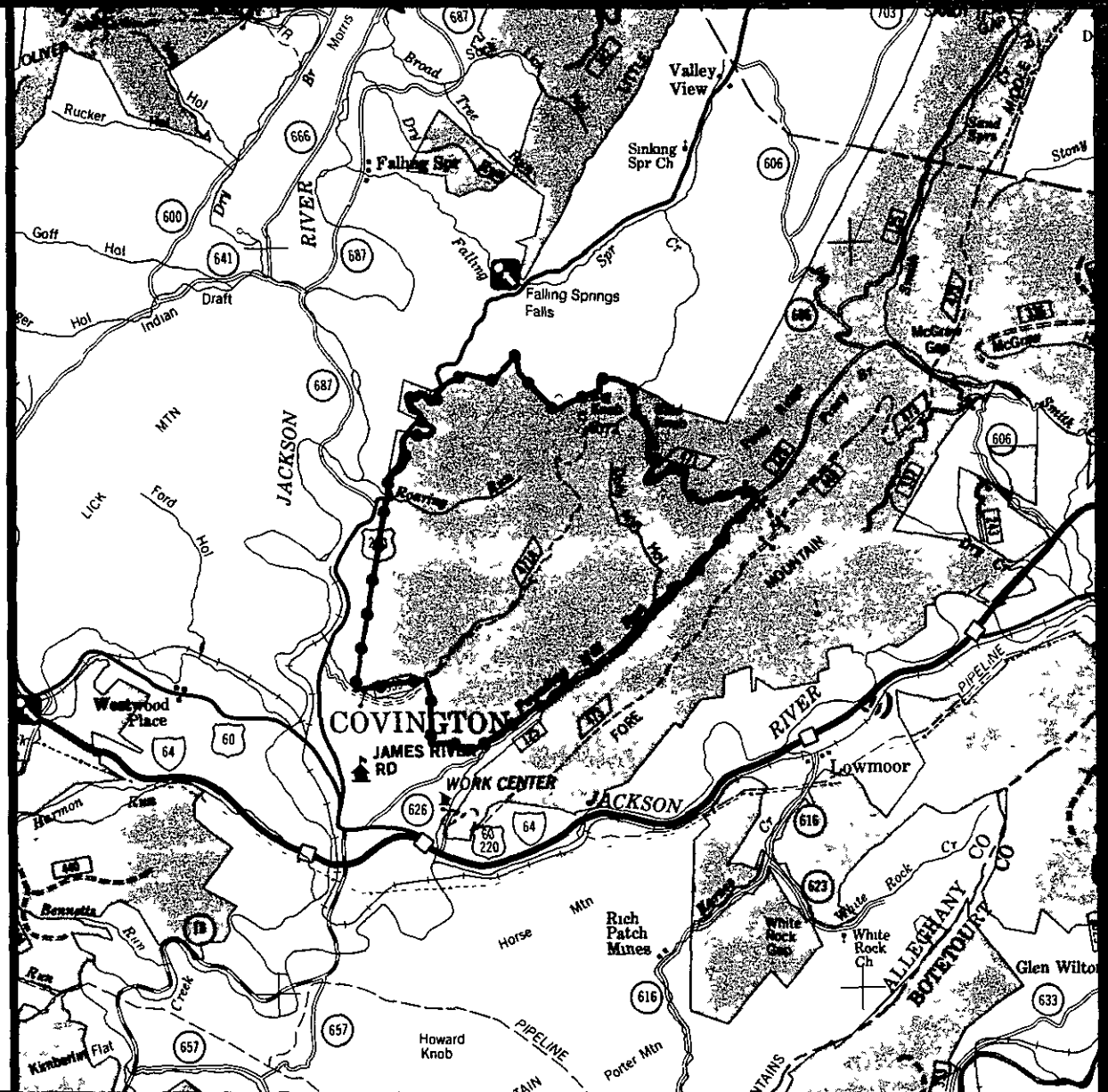
George Washington National Forest
James River Ranger District

DOLLY ANN ROADLESS AREA

Scale

1:126,720
1/2 inch = 1 mile

Roadless Area



DOLLY ANN ROADLESS AREA

I. DESCRIPTION

Acres: approximately 7,804

Location and vicinity Dolly Anne is located on the James River Ranger District, George Washington National Forest about 1 mile northeast of Covington, Virginia in Alleghany County, Virginia.

Describe access to the area including roads and trails leading to the area. Primary access is Forest Service Road 339 which leads directly to the area from the City of Covington Virginia Forest Service Road 125 provides access on the east side of the area and U S Route 220 provides limited access on the west side U S Route 220 and Forest Service Road 125 are through roads open year long to public vehicle traffic Forest Service Road 339 is open seasonally (April 1 through December 31)

The Dry Run trail begins at the end of Forest Service Road 339 and runs for nine miles through the center of the area to connect with the Skyline trail which ends on Forest Service Road 125 at the divide between Pounding Mill Creek and Piney Branch

General description of the area geography. *Dolly Anne lies within the Allegheny Range of the Appalachian Mountain Range* It is within the Ridge and Valley Physiographic Province of Virginia at the southeastern end of Warm Springs Mountain

General description of the area topography. Dolly Anne contains the highest point in Alleghany County Elevations range from approximately 1,480 feet near Covington to 4,072 feet at Big Knob. There is a rock cliff near the top of the mountain on the west side of Warm Springs Mountain

Dolly Ann Hollow, Roaring Run and Dry Run are smaller perennial streams within the area Roaring Run and Dry Run are very small streams

General description of the area vegetation, including the ecosystem type. On the top of Warm Springs Mountain, there is a flat which presents an open park-like atmosphere with herbaceous ground vegetation It contains large, old white oaks and variable sedge (*Carex polymorpha*) This species is considered globally rare It is on the the state endangered list and is a candidate for listing as a federally threatened or endangered species pending additional information Prescribe burning or other habitat manipulation may be necessary to maintain or enhance population numbers

The overstory vegetation for the remainder of the area is typical of the Allegheny Mountains oaks, pitch pine, table mountain pine, virginia pine, hickory, yellow poplar, etc The understory is very open except on the poorer sites which support mountain laurel and blueberries Rhododrendon is found on the moist, better sites

Key attractions, if any, including sensitive wildlife and scenic landmarks Dolly Anne Hollow (1,850 acres) was designated as a Special Management Area in the *Land and Resource Management Plan for the George Washington National Forest* Prior to 1986, it was managed as a primitive area This rugged area is characterized by large boulders, rock ledges and several small, but interesting, *waterfalls In the Dolly Anne Hollow drainage, there are several large hemlock, white pine, yellow poplar and oak trees The stream* contains native brook trout but is not heavily fished

Near the head of Dry Run and Dolly Anne Hollow there is an area that contains variable sedge (*Carex polymorpha*) which is a candidate for possible federal listing

II. INVENTORY

<u>Human Influence</u>

To what degree have humans and past and present human activity affected natural ecological processes and conditions? Dolly Anne has received little human intrusion in the past 80 to 100 years The entire area, except for a portion of Dolly Ann Hollow, was logged during the 1800s and early 1900s Iron mining commenced in this area in 1848 and ended in 1923 The eastern portion, along Pounding Mill Run, supported dispersed iron mining Prospecting pits are found over most of the area

Recent impact by man is also concentrated on the eastern margin where there are some clearcut areas that are approximately 15 to 20 years of age There are approximately five miles of old roads within the area

To what degree is the area natural or natural appearing and free from disturbance? Dolly Anne exists in a natural state with abundant plant and wildlife species represented Modern man's impact is not evident deep within the area, but is concentrated on the east, south and west perimeters

The former exploratory mining pits, mines and logging roads have experienced natural aging processes They occupy small specific sites and are not evident to the typical visitor Most of the area has been undisturbed by man's planned activities for over 15 years and is generally considered to have returned to its natural state in those cases of intrusion

If the area ecological processes and/or natural appearance have been altered by past or present human activity, is the land regaining a natural, untrammeled appearance? Natural processes over the past 70 to 80 years have removed much of the impact However, the old Dolly Anne and Iron Mountain mines are still very evident but covered with woody vegetaion

A landslide of approximately three acres and 20,000 cubic yards is adjacent to Forest Service Road 125 in Dolly Ann Hollow Although the majority of the area is rehabilitated, this scar will be visually evident for many years into the future

The only non-native vegetation is grasses that have been used on the landslide area and old roads The area as a whole has regained a natural appearance

The entire Dolly Anne area is often downwind of WESTVACO's Pulp and Paper Mill A strong odor from the paper mill is evident over the area during much of the year This mill was once listed as a major source of air pollution in the state Although many of these problems are now corrected, the mill would still be a major concern from a wilderness management standpoint, causing a significant degradation of the area air quality relative to what one would envision in a wilderness environment

Does the existing or attainable National Forest System ownership pattern, both surface and subsurface, ensure perpetuation of identified wilderness value? The Federal Government owns all surface and mineral rights for Dolly Anne The area has been under oil and gas leases in the past, but no exploration in the area has been done

Is more than 15 percent of the area in non-native vegetation? NO

Improvements, Structures, and Nonconforming Uses

Are any of the following types of areas, features or nonconforming uses present? If so, where?

Areas with evidence of historic mining at least 50 years old (Do not include areas of significant current mineral activity): Iron mining commenced in Dolly Anne in 1848 and ended in 1923 The eastern portion, along Pounding Mill Run, supported dispersed iron mining Prospecting pits are found over most of the area

A landslide of approximately three acres occurred in the Iron Mountain Mining Area in 1979 This site is within the Dolly Ann Special Management Area and is very evident from Forest Service Road 125 Approximately 20,000 cubic yards of earth slid down the mountain side during a heavy rainstorm Although approximately 75 percent is now covered with grass, this scar will be visually evident for many years

Areas under current mineral lease that contain a "no surface occupancy" stipulation NONE

Areas under current mineral lease where the leasee has not exercised development and occupancy rights NONE

Recreation improvements such as occupancy spots or minor hunting or outfitter camps: Wildlife openings along the Skyline Trail are popular as camping areas for hunters

Timber harvest areas where logging and prior road construction are or are not evident Several clearcuts along Pounding Mill Run and Forest Service Road 125 date to the late 1960s with some just outside the area less than five years of age These are being reclaimed by a natural progression of ecological forces and are evident to the knowing visitor There are approximately five miles of old logging roads within the area Although these old logging roads have been revegetated, they are evident

Cultural treatments involving plantations or plantings? There are some wildlife openings in the Dolly Ann Hollow and Skyline area Only those accessible from Skyline Trail have been actively maintained There are also a couple of wildlife waterholes

Private inholdings in the area· NONE

Dwellings on private inholdings: NONE The area of private land on the south side of Dolly Ann by the City of Covington has been targeted for subdivision development At the present time, there is a mobile home development and some housing development It is expected that undeveloped areas will be developed over the next 10-15 years

Nonconforming structures and improvements·

Alleghany County has a special use permit for a water reservoir in Roaring Run near U S Route 220 This reservoir provides the water for the Clearwater and Clearview Estates sub-divisions There is a special use permit for a water supply for a private home also on the west side of the area The private landowner drilled a well but was unsuccessful in finding an adequate water supply of desirable quality Wells in this area of Allegheny County have a history of collapsing in a couple of years

Ground-return telephone lines· NONE

Watershed treatment areas. NONE

Roads There are approximately five miles of old woods roads within the area A portion of the Skyline Trail is open to vehicles to provide access to the top of the mountain for hunting and administrative activities

Can existing nonconforming uses be effectively mitigated or terminated through removal or rapid natural deterioration? The water supply permit in Roaring Run cannot be terminated until Alleghany County develops an alternative supply for the two subdivisions Alleghany County has attempted to drill water wells on both private property and National Forest land without success The only other alternative is for the county to hook into the city of Covington system The county is working on this option but has not been successful to date At present, there are no plans to provide public water to the All Most Heaven Subdivision where one home has a special use permit for use of a spring on National Forest land

The old landslide area is approximately 75 percent revegetated with grass It will require maintenace and spot revegetation for many years to come to prevent siltation from entering Pounding Mill Run

Are improvements in the area being affected by the forces of nature rather than humans, and are they disappearing or muted? The old iron mine areas are revegetating naturally and do not present a problem They are nearly revegetated and only portions are evident to the casual observer The old woods roads are still evident but could be used for trails by blocking to vehicle use They are primarily used by hunters and firewood gathers

The old clearcut areas have been regenerated and are in a sapling/pole timber class

III. EVALUATION

Capability

Does the area contain the basic characteristics that make it suitable for wilderness designation without regard to its availability for or need as wilderness? Consider the following characteristics in analyzing the quality of the wilderness resource. If these characteristics are determined to be important, describe and refer to them

Experiential benefits Does the area provide the opportunity for solitude and serenity? Limited trails, steep terrain and low visitation translate into good opportunities for solitude

Dolly Ann is within 1/2 mile of the WESTVACO Pulp and Paper Mill in Covington The area is downwind of this mill The entire area is affected almost continously by odor eminating from this mill This phenonmenon reduces the opportunity for solitude and serenity

Challenge Does the area offer visitors the opportunity to experience adventure, excitement, challenge, initiative, or self-reliance. Is access easy or difficult? Access into the area is easy from the south and north via the Dry Run and Skyline trails There is no trail in Dolly Ann Hollow, but access is available from Forest Service Road 125 where Dolly Ann Hollow empties into Pounding Mill Run

Outdoor Recreation Opportunities What is the area capability for providing primitive and unconfined types of recreation including

Camping - A a limited amount of dispersed camping occurs along the Dry Run Trail and a significant amount of camping by hunters along the Skyline Trail.

Hunting - The area is popular for hunting

Fishing - There are native brook trout in Dolly Ann Hollow and reports of brook trout in Dry Run, Pounding Mill Run is a stocked trout stream under the VDGIF "put-and-take" program

Mountain Climbing - NONE

Ski Touring - NONE

Canoeing - NONE

Boating - NONE

River Rafting - NONE

Backpacking - There are opportunities for backpacking in a primitive setting

Hiking - There are opportunities for hiking in a primitive setting

Riding - There is some horseback riding on the fringes of the area

Photography - There are good opportunities

Special Features

What is the area capability to provide outdoor education and scientific study, both formal and informal, in a manner compatible with wilderness? An absence of planned human activity in Dolly Anne offers an opportunity for ecological study focusing on vegetation, wildlife and watershed

Is there an abundant and varied wildlife population? Dolly Anne contains deer, bear, turkey and squirrel and nongame species of birds and animals

Manageability.

What are the characteristics of the surrounding area including ROS classification, adopted VQO, and present and planned uses? The ROS for the surrounding National Forest land is roaded natural The visual quality objective for the surrounding area ranges from Partial Retention to Modification in the surrounding area of National Forest

Do boundary locations conflict with important existing or potential public uses outside the boundary that might result in demands to allow nonconforming structures and/or activities in the wilderness? Private property on the south side of Dolly Anne presently has some sub-divisions for private homes The remainder is presently being surveyed for inclusion within the boundaries of the City of Covington for development as housing sub-divisions The private property on the west side presently has some private development in the form of private homes and sub-divisions. Large-scale residential development around Dolly Anne would present serious wilderness management problems

Several old woods roads coming off of private land on the west and south side are used by adjacent landowners to gather firewood and for hunting access

Is it possible to readily and accurately describe, establish, and recognize boundaries on the ground? The southern and northern boundaries of Dolly Anne consists of painted property boundaries The remainder of the boundary consists of the Skyline Trail, U S Route 220 and Forest Service Road 125 All of these boundaries are easy to accurately describe, establish and recognize on the ground

Do boundaries, where possible, conform with terrain or other features that constitute a barrier to prohibited use? NO

Do boundaries, to the extent practicable, act as a shield to protect the wilderness environment inside the boundary from the sights and sounds of civilization? Traffic noise is evident on the west side and east side of Dolly Anne Noise from the private residences and WESTVACO is evident on the south end of Dolly Anne

Do boundaries provide adequate opportunity for access and traveler transfer facilities? YES

Availability

Describe other (nonwilderness) resource demands and uses.

Recreation - Present recreation use consists primarily of hunting in the fall and spring There is a limited amount of dispersed camping and hiking Some fishing occurs in Pounding Mill Run on the east edge of the area and a very small amount in Dolly Ann Hollow Some horseback riding occurs along the fringe of the area There is moderate camping during the fall hunting season along the Skyline Trail and in the Pounding Mill Run area Dolly Anne is available for firewood gathering (dead and/or down timber)

Information on Wildlife Species, Populations, and Management Needs - Fish Habitat improvement work has been accomplished in Pounding Mill Run with additional improvements planned Some wildlife openings are maintained on Fore Mountain and Piney Branch areas A complete inventory of the area flora and fauna has not been completed

Water Availability and Use - There are several perennial streams located in Dolly Anne

Livestock Operations - NONE

Timber - NONE

Minerals - NONE

Cultural Resources - The iron mines and iron mine tests are the most abundant and evident cultural resources found within this area Depending upon the amount of historic disturbance, one may encounter prehistoric sites along Pounding Mill Creek and along the floodplains and terraces of the perennial streams that drain the area The areas of flat terrain found on the ridge tops were probably not used prehistorically unless there was a source of perennial water adjacent to them If water is present, one may find some prehistoric occupation of these higher elevation areas

Authorized and Potential Land Uses - WKEY a local radio station is studying a proposed site within Dolly Anne near Big Knob in the headwaters of Roaring Run for an antenna site The station has prepared a special use application and is working with a private consultating firm to complete the environmental analysis and report This proposed site is not a designated electronic site

Information provided by the radio station indicates that the proposed antenna site is the only location that will meet FCC regulations to not interfere with other stations within a 50 mile radious of Covington and not violate the Greenbank Quiet Zone

Alleghany County has a special use permit for a water reservoir in Roaring Run near U S Route 220 This reservoir provides the water for the Clearwater and Clearview Estates sub-divisions

There is a special use permit for a water supply for a private home also on the west side of Dolly Anne The private landowner drilled a well but was unsuccessful in finding an adequate water supply of desirable quality Wells in this area of Allegheny County have a history of collapsing in a couple of years

Management Considerations Including Fire, Insects and Diseases, and Presence of Non-Federal Lands - Fires have occurred within the area over the years but have done little damage within the last 50+ years Some of the area timber is dying due to old age and oak dieback is very prevelent in some oak stands Some small areas of timber were blown down during Hurricane Hugo in 1989 along with two large areas Male Gypsy Moths have been trapped in the area for the last three years under the AIPM program and it is expected that defoliation will occur within the next 5 to 10 years The variable sedge (carvex polymorpha) is a fire dependent species which requires this periodic disturbance to flower and set seed In the absence of fire it exists in a vegetative state Prescribed fire will be needed in the management of the species

What outputs are currently produced or could be produced in the future? The area presently serves as good bear and turkey habitat and could be enhanced through habitat manipulation Portions of the area have been actively managed for timber and wildlife habitat and have been used for personal wood cutting

Dolly Anne has some of the most productive timber growing sites on the James River Ranger District and is so close to the market that the commercial value of this resource is high Based on stand records, there are approximately 7,200 acres of National Forest land suitable for timber production within Dolly Anne This includes any productive lands that are within the present Dolly Ann Hollow Special Management Area Timber production potentials are good because of (1) the productivity of the stands, (2) the proximity to a major user (WESTVACO) in nearby Covington, and (3) the ease of access and logging operability

Is the area located such that the need for increased water production and/or additional onsite storage is so vital that installation or maintenance of improvements is an obvious and inevitable public necessity? The county reservoir in Roaring Run will be needed to supply water to county residents for the near future The springs that supply water to private residents will be needed for the future

Would wilderness designation seriously restrict or prevent the application of wildlife and/or threatened and endangered plant or animal management measures of considerable magnitude and importance? NO The Variable Sedge (Carex polymorpha) may require habitat manipulation such as prescribe burning to maintain or enhance population numbers Research will be needed to determine how the habitat should be managed

Is it a highly mineralized area of such strategic or economic importance and extent that restrictions or controls due to wilderness designation would not be in the public interest? Iron ore was mined from the area in the 1800s and early 1900s The area has been studied for mineral potential several times over the last 150 years with the last study done by the U S Bureau of Mines of the Department of Interior in 1982 For oil and gas, they concluded that, while there existed a potential for energy resources in the area, there was a lack of sufficient field data to determine the degree of this potential The study stated that there were large deposits of iron ore in the study area but of not uniform grade Their conclusion was that, because large quantities of uniform grade ore are needed for today's market, Dolly Anne cannot be considered to have any present day commercial value The same conclusion was drawn for other mineral resources in Dolly Anne

Does the area contain natural phenomena of such unique or outstanding nature that general public access and special development to facilitate public enjoyment should be available? NO

Is the land needed to meet clearly documented resource demands such as for timber, mineral production, or developed recreation? NO

Is the land committed through contractual agreements for use, purposes, or activities not in concert with wilderness requirements? YES Two special use permits exists in Dolly Anne for water use It is expected that these will still be needed for the forseeable future

<u>Need</u>

Other Wildernesses:

How far is it to the closest existing wilderness? Dolly Anne is approximately 11 miles southeast of Rough Mountain Wilderness, 13 miles east of Rich Hole Wilderness and 12 miles northwest of Barbours Creek Wilderness

What level of use currently exists in near-by existing wilderness? What trends exist in the use of these areas? Both Rough Mountain and Rich Hole Wilderness areas are located in close proximity to Dolly Anne Use in these two areas has traditionally been low In 1989, the Warm Springs District reported only 300 recreation visitor days of use in Rough Mountain This low level of use can be attributed, in part, to the limited access to the area Rough Mountain is almost entirely surrounded by private land Reported recreation use in Rich Hole Wilderness in 1989 totaled 3,500 recreation visitor days Trends indicate that, while use is increasing, it is increasing at a relatively slow rate

Is the population in and around these areas increasing or decreasing? How quickly is it increasing or decreasing? Dolly Anne is located in Alleghany County According to Studies of visitors to the St Marys wilderness on the Pedlar Ranger District have indicated that the visitors often travel up to 100 miles to get to the area In light of this, it is useful to look at the population of the state of Virginia and West Virginia Between 1980 and 1990, the population of the State of Virginia increased at an annual rate of 1 4 percent while the population for the state of West Virginia decreased at an annual rate of 0 4 percent

Nonwilderness Lands

Are there opportunities for unconfined and primitive recreation experiences on nonwilderness areas in the vicinity? If so, where? Many acres of National Forest land, suitable and available for primitive recreation, are within a reasonable distance from Dolly

Anne Douthat State Park is approximately six miles to the northeast of Dolly Anne The State Park provides for primitive recreation as well as developed recreation needs

Habitat·

Are there any biotic species in the area that are directly competing with increasing public use and development? *There are* no known biotic species in the area that are directly competing with increasing public use and development

Could needs be provided through means other than wilderness designation? Not applicable

Is there a need to provide a sanctuary for biotic species that cannot survive in less than primitive surroundings? No

George Washington National Forest
Dry River Ranger District

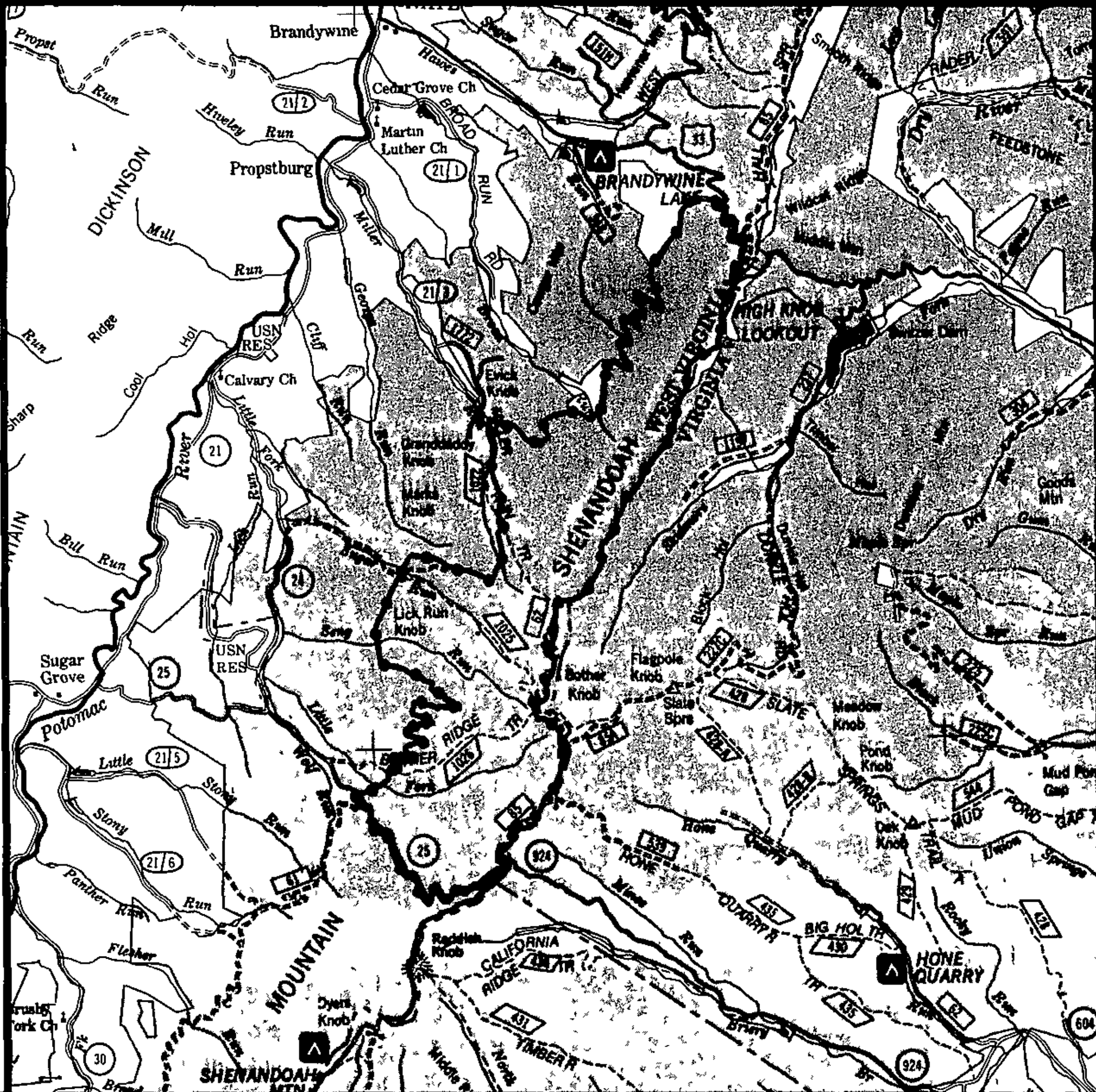
DRY RIVER ROADLESS AREA

Scale

1:126,720

1/2 inch = 1 mile

Roadless Area



DRY RIVER ROADLESS AREA

I. DESCRIPTION

Acres: approximately 7,313

Location and vicinity The area is located on the Dry River Ranger District, George Washington National Forest It is located in Pendleton County, West Virginia between U S 33 on the north and West Virginia Route 25 on the south The eastern boundary is the state line along the top of Shenandoah Mountain The western boundary is located to avoid private lands, existing public roads and recent timber sale activity The southern boundary excludes West Virginia Route 25 and the utility corridor to Sugar Grove Naval Research Station

Describe access to the area including roads and trails leading to the area The boundary can be accessed by the following roads U S Highway 33, West Virginia Route 25, Virginia Route 924 and Forest Roads 34 and 85 These roads are open to the public all year

The following Forest Service trails provide access· 1021, 1022, 1025, 1026 and 1035 Additionally, there are a number of additional trails not on the forest's official transportation system, used primarily by hunters, that exist throughout the area

General description of the area's geography. The area lies within the Valley and Ridge Physiographic Province of West Virginia It contains narrow mountain ridges with parallel drainages running in a southeast to northwest alignment

General description of the area's topography. Elevations range from approximately 2,000 feet on the western edge in Sugar Run to 4,000 feet near Bother Knob on the southeastern side Slopes vary from moderate to very steep and are dissected by numerous small streams

General description of the area's vegetation, including the ecosystem type The area is entirely forested A mixed eastern hardwood forest containing mostly oaks and hickories occurrs on northern and eastern slopes and other moist sites The best sites, usually in the deeper, more moist drainages, contain cove hardwoods including black and red oak, birches, ashes and maples The poorest sites, on ridge tops and southern and western facing slopes contain a mixture of oaks, yellow pines and white pines

Understory vegetation varies with aspect and moisture regime of a site Riparian vegetation exists along perennial and larger intermittent streams The driest sites contain fetterbush, scrub oaks, and yellow and white pine regeneration Intermediate sites contain pine and a lesser amount of hardwood regeneration, understory tree species such as dogwood and black gum, laurel, and sparse amounts of herbaceous plants

Key attractions, if any, including sensitive wildlife and scenic landmarks There are no significant landforms, or other prominant features The land is steep and rugged, particularly near the top of Shenandoah Mountain Sensitive wildlife species include black bear, which requires remote habitat and the Cow Knob Salamader, endemic to the higher elevations of Shenandoah Mountain

II INVENTORY

Human Influence

To what degree have humans and past and present human activity affected natural ecological processes and conditions? Except for the deeper, most rugged drainages, most of the area was cut over in the late 1800's and early 1900's The majority of the forested lands in the area are approximately 90 years old The area burned frequently prior to government acquisition

About 350 acres on the extreme western side of the area have been logged since 1986 About 90 of these acres were planted with white pine There are about 15 grassy, man-made wildlife clearings and about eight man-made wildlife water holes within the area

Little evidence of turn-of-the-century activities on ecological processes exists Recent activities have had little impact on ecological processes and conditions in the area

To what degree is the area natural or natural appearing and free from disturbance? Except for the recent timber harvest areas and wildlife improvements the area appears to be in a natural condition

U S Navy fighter jets frequently make low level flights over the area, causing sudden loud impacts on the area Sounds of farm equipment and vehicles traveling State highways can be heard in the western portion

If the area's ecological processes and/or natural appearance have been altered by past or present human activity, is the land regaining a natural, untrammeled appearance? Except for the recent timber harvest, the area appears natural to the average visitor

Does the existing or attainable National Forest System ownership pattern, both surface and subsurface, ensure perpetuation of identified wilderness value? There are no apparent ownership patterns that would preclude perpetuation of wilderness values

Is more than 15 percent of the area in non-native vegetation? NO

Improvements, Structures, and Nonconforming Uses

Are any of the following types of areas, features or nonconforming uses present? If so, where?

Areas with evidence of historic mining at least 50 years old (Do not include areas of significant current mineral activity)· NO

Areas under current mineral lease that contain a "no surface occupancy" stipulation. No current leases

Areas under current mineral lease where the leasee has not exercised development and occupancy rights: NONE

Recreation improvements such as occupancy spots or minor hunting or outfitter camps. There are primitive, dispersed camping sites scattered throughout the area There are some trail signs and markers and possibly a few information and education signs located within the area

Timber harvest areas where logging and prior road construction are or are not evident There are 17 timber harvest cutting units which have been logged since 1986 These units have revegetated temporary roads and skid trails associated with them These harvest areas and associated roads and skid trails are evident

Some of the old access and logging roads built prior to government acquisition still exist These old roads are overgrown, but the roadways are still evident to the keen observer

Cultural treatments involving plantations or plantings: About 350 acres of timber harvest comprising 17 cutting units have been site prepared with chainsaws since 1986 About 90 acres have been planted with white pine

Private inholdings in the area: NONE

Dwellings on private inholdings. NONE

Nonconforming structures and improvements: NONE

Ground-return telephone lines: None within the area An AT&T underground fiber optic cable is buried adjacent to the southern boundary of the area

Watershed treatment areas: NONE

Roads: The following Forest Service System Roads exist within the area FDR 31-- 8 mile closed and re-vegetated FDR 32-- 6 mile closed and re-vegetated
FDR 32A- 1 mile closed and re-vegetated

In addition, there are a few old, open roads in the area that are not on the forest's official transportation system

Can existing nonconforming uses be effectively mitigated or terminated through removal or rapid natural deterioration? YES

Are improvements in the area being affected by the forces of nature rather than humans, and are they disappearing or muted? The timber sale harvest areas are being managed through follow-up site treatments with chainsaws to assure adequate regeneration Wildlife clearings are mowed every other year Wildlife ponds receive maintenance to keep them functioning All system roads within the area are closed and re-vegetated Periodically these roads are inspected and re-seeded All of the above improvements are visually evident If left to the forces of nature, they would become muted and disappear over time

III. EVALUATION

Capability

Does the area contain the basic characteristics that make it suitable for wilderness designation without regard to its availability for or need as wilderness? Consider the following characteristics in analyzing the quality of the wilderness resource. If these characteristics are determined to be important, describe and refer to them

Experiential benefits. Does that area provide the opportunity for solitude and serenity? The area provides some opportunities for solitude and serenity Typical of many eastern wilderness areas, the small size of the area and the fact that it is bordered by open roads limits these opportunities The sights and sounds of human activity are particularily evident in the South Branch Valley

Challenge. Does the area offer visitors the opportunity to experience adventure, excitement, challenge, initiative, or self-reliance Is access easy or difficult? Access to the area will be off Forest Service system roads that border the area and system and other trails that exist in the area The area can be easily accessed

While the area does offer opportunities for adventure, exictement and challange, these opportunities are not unique to this particular area Steep terrain in the area does make cross country travel difficult and challenging, but again, these challenges are not unique to this particular area

None of the area is over 3 or 4 miles from a place of permanent human habitation, such as a farm house, or U S Navy antenna site

Outdoor Recreation Opportunities. What is the area's capability for providing primitive and unconfined types of recreation including

Camping· There are numerous opportunities for primitive camping

Hunting· The area is currently very popular for deer, bear, wild turkey and squirrel hunting

Fishing: There are no streams with sufficient flow to sustain a native trout population

Mountain Climbing· There are no known sites suitable for this activity

Ski Touring. Snowfall is not sufficient and dependable enough to establish ski-touring as a major activity A few local people may cross country ski as conditions permit

Canoeing· There are no streams or rivers large enough to support this activity

Boating: There are no streams or rivers large enough to support this activity

River Rafting: There are no streams or rivers large enough to support this activity

Backpacking· The area is excellent for backpacking Trips lasting several days are possible

Hiking: The area contains a good system of hiking trails The trail system is especially suited for day-trips into the area.

Riding: Horseback riding is allowed on all of the trails in the area The trail system is suitable for trips of less than a day's duration

Photography: While opportunities for photography exist, there are no features that make this area better for photography than other areas on the forest

Special Features·

What is the area's capability to provide outdoor education and scientific study, both formal and informal, in a manner compatible with wilderness? Studies and education on undisturbed Eastern hardwood, pine-oak, and oak-pine forests could be done All of the area can be easily reached in a day

Is there an abundant and varied wildlife population? The area supports black bear, white-tailed deer, wild turkey, squirrels and a number of other game and non-game species typical of the Mid-Appalachian region

The Cow Knob salamander, endemic to Shenandoah Mountain, inhabits the upper elevations of this area The endangered Virginia big-earred bat inhabits a nearby cave and probably forages over this area Peregrine falcons were "hacked" (raised and released) adjacent to this area and may occasionally use the skies above the area for hunting No potential nesting sites (high cliffs) are known to be in the area South or southwest facing slopes underlain with Devonian shales may harbor rare flora and possibly lepidoptera Red crossbills inhabit the area A complete flora and fauna inventory has not been conducted in the area

Manageability.

What are the characteristics of the surrounding area including ROS classification, adopted VQO, and present and planned uses? The surrounding area is classified as Roaded Natural, since the area is surrounded by State and Forest Service roads The visual quality objective (VQO) assigned to surrounding lands is modification to the west and partial retention on lands to the east

Do boundary locations conflict with important existing or potential public uses outside the boundary that might result in demands to allow nonconforming structures and/or activities in the wilderness? There are no known potential problems with the boundary locations Reddish Knob, located just south of the area, is used for hang gliding Some over-flights of the southern portion of the area may occur

Is it possible to readily and accurately describe, establish, and recognize boundaries on the ground? There are several locations where the area's boundary would be difficult to locate and post on-the-ground The lower, western boundary of the area goes from high-point to high-point and then picks up and follows the 2,800 foot contour south to Bother Ridge This boundary would be difficult to establish A small segement of the western boundary on the northern end of the area would also be difficult to establish and post This segment goes cross-country as indicated on the map A portion of the eastern boundary follows the Virginia/West Virginia boundary and to the extent that boundary is locatable, could also be difficult to identify

Do boundaries, where possible, conform with terrain or other features that constitute a barrier to prohibited use? Much of the area's boundaries follow roads and large ridges In these locations, there are no physical boundaries that effectively prevent prohibited uses

Do boundaries, to the extent practicable, act as a shield to protect the wilderness environment inside the boundary from the sights and sounds of civilization? To the extent possible for a rural area of the Eastern U S., the boundaries provide this protection However, due to the small size and narrow width of the area and its closeness to the South Branch Valley with the small Navy base and antenna site and numerous small farms and several small communities, sights and sounds of human activity will be present

Do boundaries provide adequate opportunity for access and traveler transfer facilities? YES

Availability

Describe other (nonwilderness) resource demands and uses·

Recreation - The interior portion of the area is used mainly for hunting Areas close to the boundary are used for dispersed camping Hiking, horesback riding, mountain bike riding, and hang gliding use is increasing in the area Illegal use of ATV's is also increasing

Information on Wildlife Species, Populations, and Management Needs - The area contains game and non-game species commonly found in the Southern Appalachians

Water Availability and Use - In the lower elevations, water is available in small streams, except for the driest times of the year In the higher elevations, seeps and scattered springs are the only water sources

Water in the streams is not safe for human consumption since it might contain various aquatic parasites that cause distress to humans Water taken directly from springs and seeps might not contain these aquatic parasites

Livestock Operations - No grazing is permitted in the area Occasional tresspass ocurrs, originating off adjacent farms

Timber - Due to steepness of the terrain and lack of cable logging operators in the vicinity, it is not accessible without the construction of expensive, mid-slope roads and an inordinate amount of constructed skid trails Many of the drainages in the area contain good quality sawtimber While the demand is high for good quality sawtimber and pine pulpwood the costs associated with accessing this area are prohibitive

Minerals - The mineral potential of the area is not fully known There is no indication that the area has potential for mineral development To date, little interest has been shown for any activity other than leasing for oil and gas exploration No active exploration has taken place

Cultural Resources - *The dry, steep, rugged terrain found within this area would have offered little opportunity for prehistoric or* historic occupation Cultural Resource surveys conducted within the vicinity of this area along Miller Run, Seng Run, and Shower Knob failed to locate any sites While the best potential for sites lies along the floodplains and terraces of larger streams, in particular Sugar Run, Seng Run, and Miller Run, one would not expect to discover any within this area

Authorized and Potential Land Uses - There are no permanent occupancy uses authorized now nor are any anticipated in the future

Management Considerations Including Fire, Insects and Diseases, and Presence of Non-Federal Lands - As in happening in many areas of the George Washington, the area will probably be defoliated by the gypsy moth over the next 5 years Southern pine beetle damage is occuring in the area and indications are that populations are building

There have been no large, human-caused fires recently One arson set occurred adjacent to the boundary, along FDR 34 The set was in retaliation for a road closure

Natural fires will occur periodically from lightning strikes If such fires occur, suppression may be more difficult, as the use of mechanized equipment is restricted to specific situations in wilderness. Since fires have been agressively suppresed since government aquisition of the land, fuel loadings are fairly high If substantial forest mortality occurs as a result of the gypsy moth or Southern pine beetle, fuel lodaing could become severe

What outputs are currently produced or could be produced in the future? The area provides ample opportunities for hunting, especially for deer, bear, turkey and squirrel Habitat manipulation in the form of openings in the forest canopy would benefit deer, bear and turkey

The area contains good quality hardwood sawtimber and pine pulpwood However, timber operators in the region are not currently equiped to remove these products from the steep slopes in an environmentally sound manner

Is the area located such that the need for increased water production and/or additional onsite storage is so vital that installation or maintenance of improvements is an obvious and inevitable public necessity? Not at the present time

Would wilderness designation seriously restrict or prevent the application of wildlife and/or threatened and endangered plant or animal management measures of considerable magnitude and importance? NO

Is it a highly mineralized area of such strategic or economic importance and extent that restrictions or controls due to wilderness designation would not be in the public interest? NO

Does the area contain natural phenomena of such unique or outstanding nature that general public access and special *development to facilitate public enjoyment should be available?* NO

Is the land needed to meet clearly documented resource demands such as for timber, mineral production, or developed recreation? NO

Is the land committed through contractual agreements for use, purposes, or activities not in concert with wilderness requirements? NO

<u>Need</u>

Other Wildernesses:

How far is it to the closest existing wilderness? It is approximately 10 miles to the Ramseys Draft wilderness area on the George Washington National Forest

What level of use currently exists in near-by existing wilderness? What trends exist in the use of these areas? According to the Recreation Information Management (RIM) use records from 1989, there were a total of 3,100 Recreation Visitor Days of use in Ramseys Draft Trends indicate a steady increase in use of the area Impacts from human recreation use are starting to show up at a few campsites along Ramseys Draft and close to the trailhead at the Mountain House recreation area

Is the population in and around these areas increasing or decreasing? How quickly is it increasing or decreasing? The population in Rockingham County, Virginia to the east of the area increased from 57,038 to 67,133 people at an annual rate of 0 7 percent between the years 1980 and 1990 The population in Pendleton county, West Virginia where the area is located increased from 7,910 to 7,997 people at an annual rate of 0.1 percent between the years 1980 and 1990

Studies of visitors to the St Marys wilderness on the Pedlar Ranger District have indicated that the visitors often travel up to 100 miles to get to the area In light of this, it is useful to look at the population of the states of Virginia and West Virginia Between 1980 and 1990, the population of the state of Virginia increased at an annual rate of 1 4 percent while the population for the state of West Virginia decreased at an annual rate of 0 4 percent

Nonwilderness Lands:

Are there opportunities for unconfined and primitive recreation experiences on nonwilderness areas in the vicinity? If so, where? There are many acres of National Forest on Shenandoah Mountain adjoining this area to the north, east and south that are suitable for primitive recreation

Habitat.

Are there any biotic species in the area that are directly competing with increasing public use and development? Recent interest in the biotic species of the high elevations of the Southern Appalacians has revealed that some plants and animal species found in the high elevations are unique Some of these species are known to exist on and near the top of Shenandoah Mountain

The demand for motorized recreation and developed recreation sites offering an increased variety of activities is increasing The demand for permitted special use events is also increasing

With the increased interest for all types of activities on the Forest, the unique biotic species found in the higher elevations of Shenandoah Mountain become increasingly more vulnerable to disturbance from humans

Could their needs be provided for through means other than wilderness designation? Yes The needs of unique, sensitive, threatened and/or endangered species could be met through the establishment of Research Natural Areas, Special Management Areas, or by allocating the area to other management prescriptions that would afford protection for these species

The George Washington National Forest is cooperating with the U S Fish and Wildlife Service in developing a conservation strategy for the Cow Knob salamander in the form of a pre-listing recovery plan This plan will specify standards by which the area will be managed to ensure the viability and long conservation of this species

Is there a need to provide a sanctuary for biotic species that cannot survive in less than primitive surroundings? This is unknown at this time Studies and data collection are being done by various agencies, groups and individuals It is thought that protection from human disturbance would benefit some of the unique species found in the high Appalachian mountain habitat

George Washington National Forest
Deerfield Ranger District

ELLIOTT KNOB ROADLESS AREA

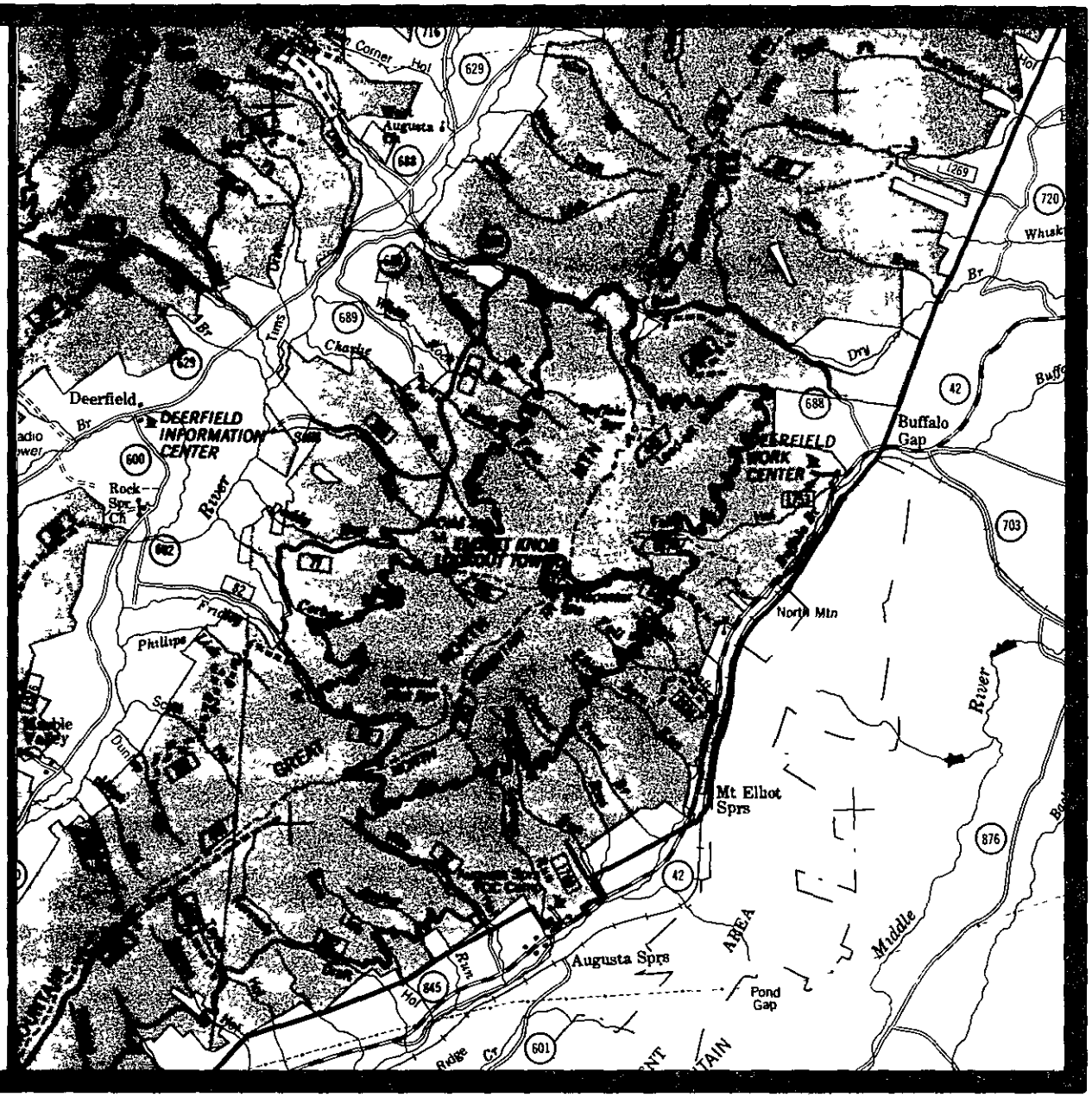
Scale

1:126,720

1/2 inch = 1 mile

N

Roadless Area



ELLIOTT KNOB ROADLESS AREA

I DESCRIPTION

Acres: approximately 9,376

Location and vicinity. Elliott Knob is located on the Deerfield Ranger District, George Washington National Forest about 15 miles west of Staunton, Virginia It encompasses the top of Great Northern Mountain in western Augusta County, Virginia.

Describe access to the area including roads and trails leading to the area. Elliott Knob can be accessed by U S 42 on the east, by Cold Springs Road (Forest Service Road 77) on the west, by Hite Hollow Road (Forest Service Road 82) on the south, and by Dry Branch Road (Virginia Route 688) on the north

Elliott Knob can be accessed by a number of trails The North Mountain Trail (443) intersects Dry Branch Road on the north and Hite Hollow Road on the south This trail transects the entire area on the ridge line in a north-south direction The Cold Springs Trail (491) is located on the western side of the mountain and intersects the ridge line near Elliott Knob Falls Branch Trail (487) leaves U S 42 near the Elliott Knob Road (448) and also goes to the top near Elliott Knob

Elliott Knob Road (Forest Service Road 448) provides access to the electronic sites on the top of Elliott Knob This road is closed to the public and used exclusively by operators at the electronic site or for administrative use It may, however, be used to provide foot access to the center of the area A narrow corridor on both sides of the road have been excluded from the proposed area

General description of the area's geography. Great North Mountains lies within the Alleghany Mountains of the Appalachian Mountain Range. It is within the Ridge and Valley Province of Virginia

General description of the area's topography. Great North Mountain generally runs northeast and southwest Elevations within Elliott Knob range from 2,200 feet in the northwestern corner to near 4,200 feet around Elliott Knob. Elliott Knob itself, the highest point on the George Washington National Forest, has been excluded from the area because of the Elliott Knob electronics site. Notable peaks include Hogback and Lead-Off Ridge with numerous smaller and unnamed elevation changes on the ridge Slopes near the ridge line are very steep with some 60% of this area exceeding 80% slopes Many small side drainages feed the larger areas Most of these are third-order tributaries with steep V-shaped drains These drainages are mostly intermittant Some are perennial at lower elevations The east side of the mountain drains into the Cowpasture River and those on the west side drain into the Calfpasture River

General description of the area's vegetation, including the ecosystem type The lower reaches of both sides of the Great North Mountain support mixed pine-hardwood species The hardwood species include scarlet oak, black oak, Northern red oak, white oak, and chestnut oak The pine species include the Table Mountain pine, pitch pine, Virginia pine and eastern white pine The understory is characteristically Mountain Laurel and saplings of oak and associated species

The higher elevation species are normally chestnut oak, black oak, and scarlet oak species which grow on poorer sites Much of the higher elevations, especially on the south and eastern side of the mountain, has bear oak as the predominant species This forms a very dense and all but impenetrable thicket Mountain laurel, huckleberry, and oak regeneration grow in the understory in the higer elevations

The Virginia Department of Conservaton and Recreation, Division of Natural Heritage, has identified several threatened and endangered plants primarily on the ridge line of Elliott Knob These plants include *Poa saltuensis* (a bluegrass) and *Trillium pusillum* var *monticulum* (Virginia least trillium) The Smooth Green Snake, *Opheodrys vernalis*, has also been identified as occurring on Elliott Knob in open grass dominated areas Other plants and animals may be identified as more intensive inventory is completed by the Division of Natural Heritage

Key attractions, if any, including sensitive wildlife and scenic landmarks Several items could be considered as key attractions in Elliott Knob The first is the elevation itself The elevation provides the ability to oversee the beauty of the surrounding valleys and mountains The elevation has also added to the effects of the vegetation in this environment Much of the higher elevations appear to have been altered by the elements Vegetation is stunted, often twisted into attractive forms

Another attractive quality of the area is its black bear habitat The dense understory vegetation and species composition makes it a very desirable place for black bear

The Virginia Department of Conservation and Recreation (Division of Natural Heritage) has proposed a 975-acre Elliott Knob Special Management Area which is located within this roadless area A Division of Natural Heritage report contains the following description of Elliott Knob

"This sandstone ridge has one of two of the world's known populations of Virginia Least Trillium, *Trillium virginicum* var *monticulum*, a C2 Federal-candidate Endangered Species. The higher elevations of Hogback and Elliott Knob also have areas of oligotrophic woodland dominated by Pitch Pine (*Pinus rigida*) and Bear Oak (*Quercus ilicifolia*) which provide habitat for the state-rare Smooth Green Snake, *Opheodrys vernalis* The oligotrophic Pitch Pine - Bear Oak woodlands also have a high potential for rare lepidoptera."

II INVENTORY

Human Influence

To what degree have humans and past and present human activity affected natural ecological processes and conditions? Elliott Knob has seen substantial influence of man in previous times The fire tower on Elliott Knob has been in existence some fifty or more years Other examples of mans' activities through time and use along the ridge of the Great North Mountain can be seen in timber harvesting activities, road construction, military landing zones, and wildlife openings developed and maintained for numerous years Currently, interest in ATV's and their use has brought much illegal use to Elliott Knob.

There has been some departure from natural ecological process by the introduction of non-native tree species which have been planted through time on Elliott Knob and along the ridge line of Great North Mountain both north and south The predominant tree species is Red Pine and is thought to have been planted during the Civilian Conservation Corps (CCC) Era While the tree species seems to fit in with the high elevation, it is, in fact, an introduced species

To what degree is the area natural or natural appearing and free from disturbance? Despite the past intrusion by humans, Elliott Knob appears natural and free from disturbance to the casual observer.

The area immediately around Elliott Knob contains a designated electronic site with numerous developed electronic facilities While the electronic site has been excluded from the roadless area boundary, it is very visible and does influence the natural appearance of Elliott Knob Since they are located on the highest peak, the electronic structures are visibile for many miles Sounds of the mechanical development and vehicle traffic associated with the maintenance are evident.

If the area's ecological processes and/or natural appearance have been altered by past or present human activity, is the land regaining a natural, untrammeled appearance? Elliott Knob has largely recovered from past alteration Present human activity has been largely confined to the lower elevations which are excluded from the roadless area

Does the existing or attainable National Forest System ownership pattern, both surface and subsurface, ensure perpetuation of identified wilderness value? The Federal Government owns all surface and subsurface rights in Elliott Knob with one exception Use of one acre within the area, and access to it, was reserved by former landowners when they sold a larger tract to the Federal Government This deed reservation includes use of one-acre of land, use of a recreation residence and a right-of-way to the one-acre area The right-of-way lies along the crest of the ridge on Great North Mountain from Forest Service Road 82 to the northeast along Forest Service Road 1595 This right will revert to the Federal Government upon the death of the current landowners

Is more than 15 percent of the area in non-native vegetation? NO

Improvements, Structures, and Nonconforming Uses

Are any of the following types of areas, features or nonconforming uses present? If so, where?

Areas with evidence of historic mining at least 50 years old (Do not include areas of significant current mineral activity): There is no evidence of mining activity in the area

Areas under current mineral lease that contain a "no surface occupancy" stipulation: NONE

Areas under current mineral lease where the leasee has not exercised development and occupancy rights: NONE

Recreation improvements such as occupancy spots or minor hunting or outfitter camps: There is one-acre deed reservation which may include a residence to be used for recreation purposes

Timber harvest areas where logging and prior road construction are or are not evident. Elliott Knob was logged by the owner prior to inclusion into the National Forest system Signs of this activity are still visible to the alert observer Tramways, old stumps, skid trails, and other similar signs can be seen within the area There has been no vegetation management within Elliott Knob during the last 20 years

The areas harvested and the roads associated with that activity are rapidly returning to a natural state

Cultural treatments involving plantations or plantings: NONE

Private inholdings in the area: There is one-acre deed reservation granted for the lifetime of the owner

Dwellings on private inholdings: The aforementioned deed reservation permits a recreation residence

Nonconforming structures and improvements: NONE

Ground-return telephone lines: NONE

Watershed treatment areas. NONE

Roads: The road accessing the Elliott Knob electronic site has been eliminated from the Roadless Area by a boundary inclusion

Forest Development Road (FDR) 1595 is an administrative road which enters the area from FDR 82 on the south boundary It provides the only access to the lifetime inholding described earlier It follows a northeast direction ending at Hog Back and is approximately 2 5 miles long

Short segments of FDR 82C and 82D also enter the area from FDR 82 These are administrative, D-level roads and their total length, inside the area, is approximately 2,25 miles

Can existing nonconforming uses be effectively mitigated or terminated through removal or rapid natural deterioration? The deed reservation previously described will only last the lifetime of the private owner who sold the tract to the Federal Government The Elliott Knob electronic site has been eliminated from the area by an inclusion in the boundary

FDR 82C, 82D, and 1595 could be permanently closed They would be visually evident for many years to come

Are improvements in the area being affected by the forces of nature rather than humans, and are they disappearing or muted? The Forest roads are currently maintained to D-level standards and, as such, are not returning to a natural condition

III. EVALUATION

<u>Capability</u>

Does the area contain the basic characteristics that make it suitable for wilderness designation without regard to its availability for or need as wilderness? Consider the following characteristics in analyzing the quality of the wilderness resource If these characteristics are determined to be important, describe and refer to them.

Experiential benefits. Does that area provide the opportunity for solitude and serenity? Limited trails, steep terrain and low visitation translate into good opportunities for solitude in the area's interior In the areas around the boundary and the electronic sight, the sights and sounds of civilization can be heard and/or seen

Challenge. Does the area offer visitors the opportunity to experience adventure, excitement, challenge, initiative, or self-reliance. Is access easy or difficult? Access is provided for hikers interested in enjoying primitive recreation including hiking, backpacking, hunting, horseback riding, or photography Challenge and adventure are readily available if one does not limit one's self to an existing trail and is willing to travel cross-country

Outdoor Recreation Opportunities. What is the area's capability for providing primitive and unconfined types of recreation including·

Camping. Elliott Knob offers ample opportunities for primitive camping

Hunting: *Elliott Knob offers good opportunities for hunting*

Fishing: NONE

Mountain Climbing: NONE

Ski Touring· NONE

Canoeing· NONE

Boating. NONE

River Rafting: NONE

Backpacking: Elliott Knob offers opportunities for backpacking in a primitive setting

Hiking Elliott Knob offers opportunities for hiking in a primitive setting

Riding· Elliott Knob offers opportunities for horseback riding in a primitive setting

Photography. Elliott Knob offers opportunities for photography that are typical of most areas in the George Washington National Forest

Special Features·

What is the area's capability to provide outdoor education and scientific study, both formal and informal, in a manner compatible with wilderness? *The ecological changes associated with the area's elevational change, including the high elevation of* Elliott Knob, could be the focus of both formal and informal education and scientific study

Is there an abundant and varied wildlife population? Elliott Knob exists in a natural state with abundant plant and wildlife species represented Wildlife populations are strong and varied, including deer, bear, and turkey A study is now in place in cooperation with the Virginia Department of Game and Inland Fisheries in hopes of confirming reports that the Northern Flying Squirrel, a federally endangered species, inhabits a portion of the Elliott Knob

Manageability:

What are the characteristics of the surrounding area including ROS classification, adopted VQO, and present and planned uses? *Elliott Knob is steep, rocky, and mountainous The Visual Quality Objective (VQO) on both sides of the mountain is retention* and partial retention The Recreation Opportunity Spectrum (ROS) is semi-primitive motorized and semi-primitive non-motorized

Do boundary locations conflict with important existing or potential public uses outside the boundary that might result in demands to allow nonconforming structures and/or activities in the wilderness? With the exception of the deed reservation for a right-of-way along Great North Mountain, there are no known conflicts with the boundary locations of Elliott Knob The Elliott Knob Electronic Site and access road have been excluded from the roadless area by a boundary inclusion.

Is it possible to readily and accurately describe, establish, and recognize boundaries on the ground? Much of the area's boundaries follow contour lines Identification, marking and maintenance of these lines would be costly and time consuming

Do boundaries, where possible, conform with terrain or other features that constitute a barrier to prohibited use? *The proposed* boundaries are located in such a fashion that protection of the Elliott Knob is enhanced.

Do boundaries, to the extent practicable, act as a shield to protect the wilderness environment inside the boundary from the sights and sounds of civilization? With the exception of the inclusion around the Elliott Knob Electronic Site and access road, the boundaries provide some protection from the sights and sounds of civilization

Do boundaries provide adequate opportunity for access and traveler transfer facilities? YES

Availability

Describe other (nonwilderness) resource demands and uses:

Recreation - Elliott Knob is predomiately used for hiking, hunting, and horseback riding

Information on Wildlife Species, Populations, and Management Needs - A complete inventory of the area's flora and fauna has not been completed Several rare species have been identified in the area by the Virginia Division of Natural Heritage

Water Availability and Use - NONE

Livestock Operations - NONE

Timber - Most of the ridgetop has been deemed unsuitable for timber management based on site productivity and steep slopes

Demands for timber resources will be minimal due to low site productivity, low value products, and a lack of access to the timber resource Active timber management does occur in the proximity of the boundary around Elliott Knob

Minerals - NONE

Cultural Resources - The relatively dry, steep, rugged terrain contained within the Elliott Knob Roadless Area would have offered little opportunity for prehistoric or historic occupation The rather flat terrain in the vicinity of Chestnut Flat Spring was occupied during preshistoric times While one prehistoric site has been recorded from this area, no systematic cultural resources survey has been conducted, and one would expect additional sites to be discovered The saddle between Elliott Knob and Hogback Knob may also contain evidence of prehistoric occupation The terrain in the vicinity of Dry Branch Gap may have served as a camping area during the Civil War The availability of water would be a limiting factor to any long-term occupation of this area Historical documents mention that a chestnut plantation existed in Chestnut Flats on the top of Great North Mountain However, no documentation can be found, and no evidence of the plantation's existence is apparent on the ground

Authorized and Potential Land Uses - The deed reservation for recreational purposes remains the one authorized land use in Elliott Knob The Elliott Knob Electronic Site has been excluded from the roadless area

Management Considerations Including Fire, Insects and Diseases, and Presence of Non-Federal Lands. Activity of Gypsy Moth is sure to affect the ecosystem of Elliott Knob The possibility of treatment for control and perpetuation of the environment as it now exists must be evaluated if the unique features of Elliott Knob are to be preserved

What outputs are currently produced or could be produced in the future? Elliott Knob offers opportunities for dispersed recreation use including hunting, hiking and horseback riding

Is the area located such that the need for increased water production and/or additional onsite storage is so vital that installation or maintenance of improvements is an obvious and inevitable public necessity? NO

Would wilderness designation seriously restrict or prevent the application of wildlife and/or threatened and endangered plant or animal management measures of considerable magnitude and importance? A Virginia Division of Natural Heritage report concerning Elliott Knob states

"Because only two populations of the *Trillium pusillum* var *monticum* are known, the population at Elliott Knob should be monitored to determine what if any specific management is needed to protect the species' occurrence

"Maintenance of the oligotrophic Pitch Pine - Bear Oak woodland found within the recommended SMA at Elliott Knob might also be a management concern Rare lepidoptera tend to be associated with this vegetation, and therefore, gypsy moth spraying should not take place here Also, this vegetation represents a fire disclimax, and future prescribed burns may help maintain and enhance the community and its suite of specialized species "

There is a large area on the ridge line near the Hog Back area that was at one time an open bald area It is now in the ecological succession process of being reclaimed by invasion such as Yellow Birch Use of this area as an open field or bald area is thought to be critical in the perpetuation and maintenance of high altitude plants and animals that use balds in their life cycle

Depending upon the species and management activity, wilderness management could impede, or perhaps, preclude active management in the area

Is it a highly mineralized area of such strategic or economic importance and extent that restrictions or controls due to wilderness designation would not be in the public interest? NO

Does the area contain natural phenomena of such unique or outstanding nature that general public access and special development to facilitate public enjoyment should be available? NO

Is the land needed to meet clearly documented resource demands such as for timber, mineral production, or developed recreation? NO

Is the land committed through contractual agreements for use, purposes, or activities not in concert with wilderness requirements? The one-acre deed reservation in the south end of Elliott Knob and its right-of-way are not in concert with wilderness requirements

Need

Other Wildernesses:

How far is it to the closest existing wilderness? Ramsey Draft Wilderness is approximately 7 miles north of Elliott Knob

What level of use currently exists in near-by existing wilderness? What trends exist in the use of these areas? According to Recreation Information Management (RIM) use records, a total of 3,000 visitor days were recorded in Ramseys Draft in 1989 Trends indicate a steady increase in use of the area This use has started to negatively impact the wilderness qualities and resources with Ramseys Draft, especially along Ramseys Draft itself

Is the population in and around these areas increasing or decreasing? How quickly is it increasing or decreasing? The population of Augusta County, where Elliott Knob is located, increased from 53,732 to 56,315 between 1980 and 1990 The counties to the east have all experienced an increase in population while those to the west, including Highland County, Virginia and Pendleton County, West Virginia have experienced a decrease in population

Studies of visitors to the St Marys wilderness on the Pedlar Ranger District have indicated that the visitors often travel up to 100 miles to get to the area In light of this, it is useful to look at the population of the state of Virginia and West Virginia Between 1980 and 1990, the population of the State of Virginia increased at an annual rate of 1 4 percent while the population for the state of West Virginia decreased at an annual rate of 0 4 percent

Nonwilderness Lands.

Are there opportunities for unconfined and primitive recreation experiences on nonwilderness areas in the vicinity? If so, where? Primitive recreation experiences can be enjoyed on Shenandoah Mountain This is the next mountain range to the west and state lands on Little North Mountain (next mountain range to the east) also offer the opportunity for unconfined adventure on the south end of Great North Mountain

Habitat:

Are there any biotic species in the area that are directly competing with increasing public use and development? Northern Flying Squirrel and some plant species may be competing with public use of the area and in some jeopardy as a result However, the analysis of this situation has just recently begun and is not complete

Could their needs be provided for through means other than wilderness designation? YES

Is there a need to provide a sanctuary for biotic species that cannot survive in less than primitive surroundings? It does not appear that Elliott Knob is needed as a refuge for biotic species

George Washington National Forest
Pedlar Ranger District

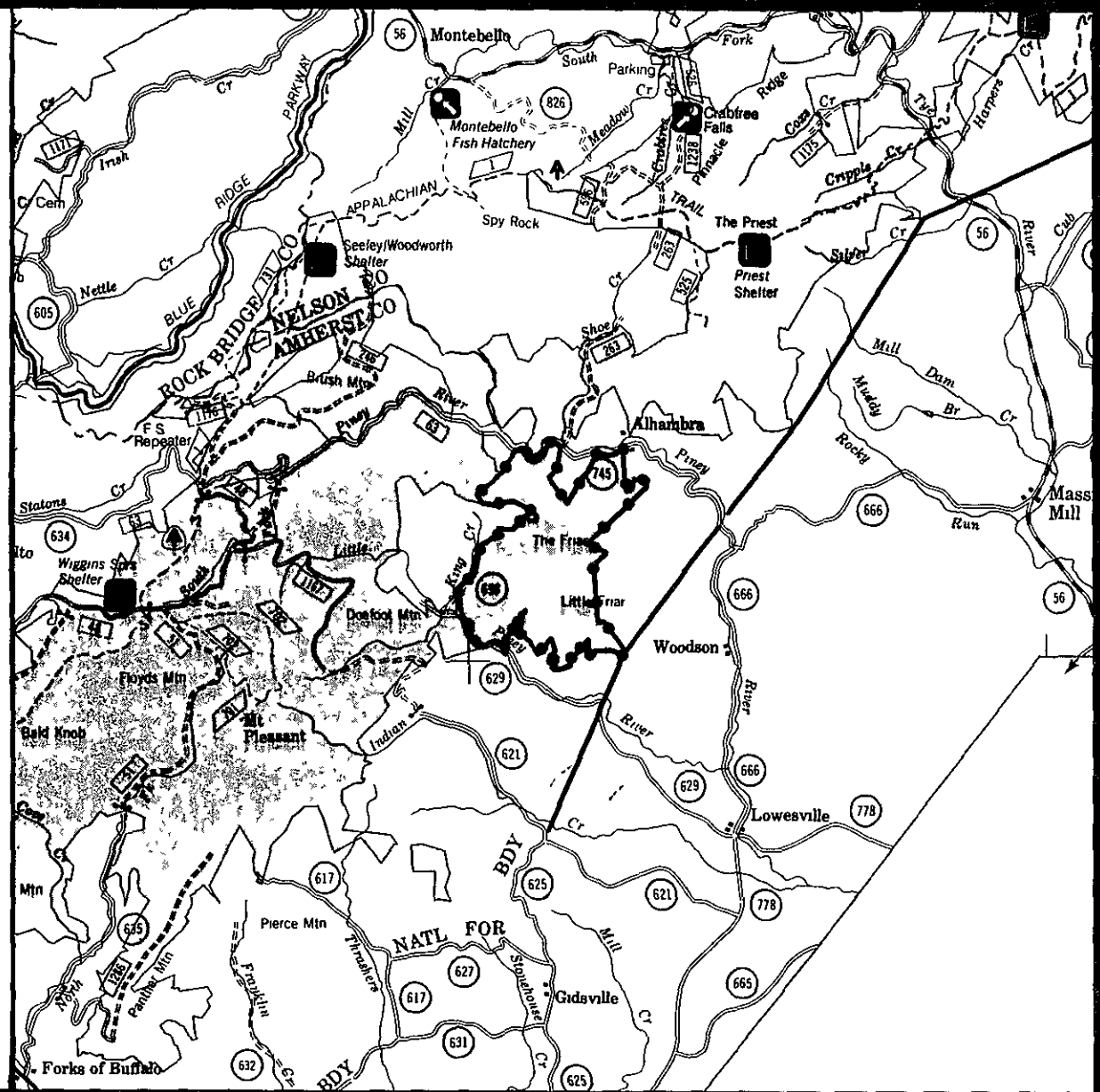
THE FRIARS ROADLESS AREA

Scale

1:126,720

1/2 inch = 1 mile

Roadless Area



THE FRIARS ROADLESS AREA

I. DESCRIPTION

Acres· approximately 2,020

Location and vicinity. The Friars area contains The Friar and Little Friar Mountains These mountains are the prominent eastern topographic features between the Piney and South Fork of the Piney Rivers The Friars area is located approximately 4 miles east of the Blue Ridge Parkway and 3 miles northwest of Lowesville, Virginia The area is in the Pedlar Ranger District, George Washington National Forest, Amherst County, Virginia

The extremely irregular boundary corresponds with the National Forest Boundary on all of the east side and over half of the south side The remaining portion of the boundary on the south side is along State Route 629 The western boundary follows State Route 698, the National Forest boundary, and Forest Trail 527 The northern boundary is along State Route 745 and the National Forest boundary

NOTE The proposed boundary was adjusted to include a small portion of a recently acquired tract along the west side in order to reduce the irregularness of the boundary in this area

Describe access to the area including roads and trails leading to the area *Access to the perimeter of the area is provided by State* Routes 698, 629, and 745 Forest Trail 527 provides limited access into the interior

General description of the area's geography The area rests atop the Blue Ridge Complex, a sequence of Cambrian volcanic and sedimentary rock The soils are of the Hayesville-Porters-Caloctin and Hayesville-Porters-Lew Soil Associations These soils are moderately deep to very deep, well drained, and developed in granite and gneiss colluvium and residium Rocky areas and perennial streams are common within this soil series

General description of the area's topography. Elevations vary from approximately 1,000 feet above sea level to a maximum elevation of 3,357 feet at the summit of The Friar The terrain is a combination of deep V-shaped hollows and high ridges Large rock outcrops are common throughout the area Most of the streams were either totally or partially scoured when Hurricane Camille deposited over 40 inches of rain in the area in August of 1969 Unless they eroded to bedrock, scars from landslides which occurred as a result of the hurrican have partially healed Water flows from King Creek to the Little Piney River, Crawley's Creek to the Piney River, and several unnamed streams on the north side of the area feed the Piney River All are tributaries of the James River Basin of the Middle Atlantic Drainage Area

General description of the area's vegetation, including the ecosystem type The area is forested with species of the Eastern *Deciduous Forest Chestnut and scarlet oak dominate the dry ridge tops and slopes The mid and lower slopes contain the red* oak-white oak-hickory type Yellow poplar, white oak, and northern red oak are the cove species represented Other species within the overstory, depending on the moisture regime, include mixtures of red maple, black cherry, black oak, sugar maple, and birch There are some white and yellow pine in this area For the most part, timber stands in the drains and lower slopes are 70+ years of age Timber stands elsewhere average over 100 years of age

The understory consists primarily of mountain laurel, dogwood, grapevines, serviceberry, huckleberry, rhododendron, and smilax vine Apple trees, persimmon, sassafras, and locust occur at old homesites

Key attractions, if any, including sensitive wildlife and scenic landmarks The Friars area is extremely steep and rugged The interior is relatively inacessible and remote for its small size Since the area contains a nearly unbroken forest canopy, senic vistas or panoramic views do not exist. Mountain streams, rock cliffs, and waterfalls are the key attractions

There is no record of any sensitive wildlife species existing within the boundaries A complete inventory of the area for sensitive wildlife species has not been done

II. INVENTORY

<u>Human Influence</u>

To what degree have humans and past and present human activity affected natural ecological processes and conditions? Archaeological evidence found within the area indicates that prehistoric man utilized the resources found in the Friars area Although no diagnostic artifacts have been found to determine when man first inhabited the area, the general Blue Ridge area was used as early

as the Paleoindian period The impact left on the land by the prehistoric population is barely noticeable, and has had no known affect on the natural ecological processes of the area

The general Blue Ridge area was settled by colonists during the early 1700s These settlers farmed the bottom lands and lower slopes, terracing what they could and leaving the remaining as pasture land Throughout the 1700-1800s and into the early 20th century, farming and logging were common activities in and around the Friars area.

Government acquisition of The Friars occurred from 1935 and 1942 Additional acquisitions were completed in 1979, 1980, and 1987 Prior to the early 1930s, drainage bottoms and lower slopes were logged and farmed Wildfires were common within the area Little evidence of past farming, logging, and fire activity on ecological processes exists

About 42 acres in two timber stands have been clearcut in the past ten years These stands are regenerating with upland hardwoods These harvests have not permanently altered the natural ecological processes or conditions of the area

To what degree is the area natural or natural appearing and free from disturbance? Except for the recent timber harvest areas with their associated skid and haul roads along State Route 698, the Friars area appears to be in a natural condition The roads associated with recent timber harvest activities have been closed and re-vegetated with grasses Older travelways within the area are covered with brush and trees

There is a cemetery containing about 30-40 graves located in the northern part of the area off State Route 745 The cemetery is still being used and is on a small private inholding accessed by a road leading off State Route 745 Both the road and cemetary could be excluded from the area through a minor boundary adjustment

If the area's ecological processes and/or natural appearance have been altered by past or present human activity, is the land regaining a natural, untrammeled appearance? Except as mentioned above, very little alteration has occurred which can be attributed to past human activity That which has occurred has regained most of its natural appearance

Does the existing or attainable National Forest System ownership pattern, both surface and subsurface, ensure perpetuation of identified wilderness value? Two narrow parcels of Forest Service land within the Friars area extend into surrounding private tracts have been identified as available for exchange on the Forest's Land Adjustment Plan Exchange of the parcels will actually improve the manageability of the area from a wilderness standpoint

The active cemetery on private land within the area and access road is not consistent with wilderness Both could be excluded through a minor boundary adjustment

Is more than 15 percent of the area in non-native vegetation? NO

Improvements, Structures, and Nonconforming Uses

Are any of the following types of areas, features or nonconforming uses present? If so, where?

Areas with evidence of historic mining at least 50 years old (Do not include areas of significant current mineral activity). NO

Areas under current mineral lease that contain a "no surface occupancy" stipulation. NO

Areas under current mineral lease where the lessee has not exercised development and occupancy rights. NO

Recreation improvements such as occupancy spots or minor hunting or outfitter camps: NO

Timber harvest areas where logging and prior road construction are or are not evident· Two timber stands, totaling 42 acres, have been clearcut within the past ten years The road constructed into the timber sale area was seeded and closed Roads and trails associated with selective logging prior to and after government acquisition have become overgrown with tree and brush

Cultural treatments involving plantations or plantings. The recently clearcut areas are regenerating naturally with upland hardwood species

Private inholdings in the area A deed exception exists for an active cemetery located near the northern boundary just off State Route 745 This cemetery is still being used Prescriptive access is provided on an open road

Dwellings on private inholdings. NO

Nonconforming structures and improvements A rock building, probably used by the Civilian Conservation Corps to house explosives, exists on the southeast side of Forest Trail 527, about one-half mile off State Route 745 The historical significance of this structure is not known

The right-of-way for State Routes 745 and 629 extend approximtely 20 feet out from the center line of the roads. A power line under permit to Appalachian Power Company exists in the right-of-way along State Route 629

Ground-return telephone lines: NO

Watershed treatment areas· NO

Roads: There are no system roads within the area A short, non-system road providing prescriptive access to a cemetery protected by deed exception exists in the northern part of the area The road is approximately one-half mile in length

Can existing nonconforming uses be effectively mitigated or terminated through removal or rapid natural deterioration? The area's boundary can be located to exclude the right-of-way and power line associated with State Route 629 The rock building can be removed

The road that receives prescriptive use to access the cemetery can be obliterated or excluded through a minor boundary adjustment

Are improvements in the area being affected by the forces of nature rather than humans, and are they disappearing or muted? The old roads, skid trails, and cutting units in the area are slowly returning to a natural appearance The oldest roads are not noticable, except where they required excavation The two clear cuts and their associated roads are evident Through time, these improvements will become less obvious

The road to the cemetery and the rock powder house are evident.

III EVALUATION

Capability

Does the area contain the basic characteristics that make it suitable for wilderness designation without regard to its availability for or need as wilderness? Consider the following characteristics in analyzing the quality of the wilderness resource. If these characteristics are determined to be important, describe and refer to them

Experiential benefits. Does that area provide the opportunity for solitude and serenity? The small size of the area and its proximity to private land and public roads severely limits opportunities for solitude and serenity Open public roads and rural *development are located within three miles from the most remote areas of The Friars*

Challenge. Does the area offer visitors the opportunity to experience adventure, excitement, challenge, initiative, or self-reliance Is access easy or difficult? The perimeter of the area can be easily accessed by state and Forest Roads Access to the central part of the area is provided by one Forest trail

Due to its small size, the area offers very limited opportunities for visitors to experience adventure or self-reliance Public roads and private dwellings are no more than three miles from the interior of the area

The ruggedness of the terrain makes cross-country travel challanging

Outdoor Recreation Opportunities What is the area's capability for providing primitive and unconfined types of recreation including

Camping - The area is suitable for primitive camping, especially in flatter locations along the area's boundary

Hunting - Rugged terrain limits hunting access and ease

Fishing - There are no streams with sufficient flow to sustain native trout populations

Mountain Climbing - There are no known sites suitable for this activity

Ski Touring - Snowfall is not sufficient and reliable enough to support this activity The terrain is too rugged to provide good opportunities for this activity

Canoeing - There are no waters in the area capable of supporting this activity

Boating - There are no waters in the area capable of supporting this activity

River Rafting - There are no waters in the area capable of supporting this activity

Backpacking - The area is suitable for backpacking Due to its small size, one-night trips would be most appropriate Cross-country travel would be challanging due to the ruggedness of the terrain

Hiking - Cross-country hiking would be challenging because of the ruggedness of the area

Riding - While riding is possible on Forest Trail 527, the trail is not maintained to standards suitable for riding The lack of a developed trail system and the rugged terrain considerably limit opportunities for riding safely in the area

Photography - Opportunities for panoramic photography are limited since there are few, if any overlooks There are opportunities to photograph wildlife and plants at close range

Special Features·

What is the area's capability to provide outdoor education and scientific study, both formal and informal, in a manner compatible with wilderness? Opportunities exist for both formal and informal education and scientific study These opportunities are typical of those found on many other areas within the Pedlar Ranger District

Is there an abundant and varied wildlife population? Several game species including grouse, turkey, and deer have been sighted, and bear sign observed Though this area is basically under custodial management, two homesites are maintained as openings for wildlife According to records, there is good soft mast and cover for both game and non-game animals

A complete inventory of the area's flora and fauna has not been completed

Manageability·

What are the characteristics of the surrounding area including ROS classification, adopted VQO, and present and planned uses? ROS The area is classified as Roaded Natural (RN), due to the proximity of open roads Much of the area's interior is more than 1/2 mile from an open road, but the size does not meet the 2,500 acre minimum requirement for Semi-Primitive non-motorized classification

VQO Most of the area has been assigned a visual quality objective (VQO) of modification or maximum modification Areas in the foreground along the state roads have an assigned VQO of partial retention Visual quality objectives are reviewed during the ongoing Forest Planning process

Present and Future Uses The Friars Area is almost entirely surrounded by private land There will continue to be a moderate amount of dispersed recreation use including fishing, camping, and hunting on adjoining private land Development of the adjacent private land for residential and recreational purposes is increasing

Do boundary locations conflict with important existing or potential public uses outside the boundary that might result in demands to allow nonconforming structures and/or activities in the wilderness? There is potential for some conflict from adjoining private landowners Motorized incursions into the area are possible Examples of possible non-conforming structures and activities include utility easements, requests for use of motorized equipment for fuelwood gathering and off road vehicle travel

Is it possible to readily and accurately describe, establish, and recognize boundaries on the ground? Yes The boundary follows a combination of roads and National Forest property boundaries and trails Some of these boundaries need refurbishment

Do boundaries, where possible, conform with terrain or other features that constitute a barrier to prohibited use? No There are no physical features along the boundaries that would serve as barriers to prevent people on private lands or adjacent public roads from entering the area with motorized vehicles

Do boundaries, to the extent practicable, act as a shield to protect the wilderness environment inside the boundary from the sights and sounds of civilization? No Due to the small size of the area and the adjoining open public roads and private lands, sights and sounds of human activity are common within the area

Do boundaries provide adequate opportunity for access and traveler transfer facilities? Yes Roads are adjacent to much of the area.

If the area contains less than 5,000 acres:

Due to physiography or vegetation, is the area manageable in its natural condition? YES

Is the area contiguous to existing wilderness, primitive areas, administration-endorsed wilderness, or roadless areas in other Federal ownership? NO

Availability

Describe other (nonwilderness) resource demands and uses·

Recreation - At present, dispersed recreation is limited due to poor access into the interior Dispersed campsites used by hunter and fishermen exist along the adjoining state roads Due to the ruggedness of the terrain, most recreational activity takes place near the public roads, along the northern and southwestern borders

Information on Wildlife Species, Populations, and Management Needs - Hard and soft mast availability are generally good, with good escape cover in the form of laurel and rhododendron The rough terrain limits human disturbance to wildlife, especially bear A great deal of wildlife and sign have been observed A lack of early successional stages of vegetation might limit the ability of some species to thrive

Turkey is presently the featured wildlife species Wildlife populations consist of the various game and non-game species associated with undisturbed, forested areas of the Blue Ridge Mountains

Water Availability and Use - Water is present and available throughout the area from intermittent and perennial streams It is found mostly at lower elevations and in drainages

Livestock Operations - There is no present or proposed livestock use in the area

Timber - There are no timber activities currently scheduled Timber harvest opportunities are limited by the ruggedness of the terrain A total of 310 acres are classified as suitable for timber management

Site indices range from 40-50 for the upper slopes and ridges, 50-70 on the lower side slopes and upper drainages, and 70-100 in the lower drainages

Minerals - There are no reserved or outstanding mineral rights or mineral leases The rare-earth-bearing minerals, allanite and sipylite (fergusonite) are known to occur in pegmatites in the Friar Mountains These mineral materials may become more important in the *future There is no known potential for oil or gas recovery*

Cultural Resources - Most of this area consists of terrain too steeply sloping to have offered good camping opportunities for prehistoric populations Prehistoric sites are known to exist along King's Creek

Several old homesites are located in the northern part of the area, on the lower elevations near the Piney River Two of these are maintained as wildlife openings There are also several old homesites near State Route 629, along the southwest border There may be an old homesite near a spring on the east side of the saddle between the two Friars Some prehistoric lithic material has been *discovered here, but has not been extensively investigated*

One drainage contains a small stone building which appears to be an old CCC powder house

Authorized and Potential Land Uses - The cemetery on private land in the northern portion is frequently used The old road accessing the cemetery is open under prescriptive use The Appalachian Power Company is permitted a power line in the right-of-way for State Route 629

Management Considerations Including Fire, Insects and Diseases, and Presence of Non-Federal Lands - FIRE Recorded fires in the recent past have been small in size, and because of protection from fire while under National Forest Management, there is a considerable buildup of small and large fuels Fire suppression would be very difficult because of limited access and the steep terrain Suppression would most likely require air support, portable pumper units for extensive hose lays, and large crews with hand tools

INSECTS AND DISEASE Defoliation by the gypsy moth is likley within the next few years Male moths have been trapped in the area Timber stands in the area contain tree species highly susceptable to defoliation

LANDS A cemetery with access road exists off State Route 745 The cemetery was excepted from the deed when the land was acquired The cemetery is private land

Two tracts of Forest Service land within the area have been identified as suitable for exchange in the Forest Land Adjustment Plan

What outputs are currently produced or could be produced in the future? Dispersed recreational activities, primarily hunting and hiking will continue Timber in the more accessable areas could be harvested for wood products including lumber, pulpwood and fuelwood No mineral development is currently taking place nor anticipated If private land near the area becomes more highly developed, there would most likely be some increased demand for special uses such as utility lines and access roads

Is the area located such that the need for increased water production and/or additional onsite storage is so vital that installation or maintenance of improvements is an obvious and inevitable public necessity? NO

Would wilderness designation seriously restrict or prevent the application of wildlife management measures of considerable magnitude and importance? NO The area currently lacks early successional vegetation This habitat component can most easily be provided through timber sales or prescribed burning Wilderness designation would preclude timber management activities and, possibly, prescribed fire The currently maintained wildlife openings would eventually revert to a forested condition, as would the Kings Creek Timber Sale cutting units

Is it a highly mineralized area of such strategic or economic importance and extent that restrictions or controls due to wilderness designation would not be in the public interest? NO

Does the area contain natural phenomena of such unique or outstanding nature that general public access and special development to facilitate public enjoyment should be available? NO

Is the land needed to meet clearly documented resource demands such as for timber, mineral production, or developed recreation? NO

Is the land committed through contractual agreements for use, purposes, or activities not in concert with wilderness requirements? Only where previously described special uses are in effect

Need

Other Wildernesses:

How far is it to the closest existing wilderness? The 8,903 acre James River Face Wilderness, on the Jefferson National Forest, is about 15 miles to the southwest of this area The 9,835 acre Saint Marys Wilderness, on the Pedlar District, is about 8 miles to the north Both wildernesses are within the Blue Ridge Range of the Appalachian Mountain System

What level of use currently exists in near-by existing wilderness? What trends exist in the use of these areas? An estimated 6,000 visitor days of recreation were recorded in St Marys Wilderness in 1989 This is a significant amount of use that has resulted in serious impacts on the area's wilderness qualities and the resources Campfire restrictions have been implemented in St Marys along the St Marys River in an attempt to mitigate these impacts Trends indicate that use in St Marys has increased steadily over time

Is the population in and around these areas increasing or decreasing? How quickly is it increasing or decreasing? Populations in the Counties surrounding the Friars are increasing The population in Amherst County, where the Friars is located, increased from 29,122 to 29,360 between 1980 and 1990

Nonwilderness Lands.

Are there opportunities for unconfined and primitive recreation experiences on nonwilderness areas in the vicinity? If so, where? These experiences can be found in the following areas· Mount Pleasant, Three Ridges, Three Sisters, the Priests, Adams Peak, and Kelley Mountain There are numerous acres of National Forest Land within reasonable distance for primitive type recreational opportunities

Habitat·

Are there any biotic species in the area that are directly competing with increasing public use and development? Increased use and development could possibly have an adverse effect on bear if existing uses increase, or if the area is penetrated by new roads or trails

Could their needs be provided for through means other than wilderness designation? Wilderness designation would not be necessary to protect bear or other wildlife species in this area from human disturbance Access roads, if needed for management purposes could be closed to the public, minimizing the effects on wildlife Compliance with Forest Plan Standards and Guidelines should be sufficient to maintain current wildlife populations in the area.

Is there a need to provide a sanctuary for biotic species that cannot survive in less than primitive surroundings? Current management of the area already serves that purpose

George Washington National Forest
Dry River Ranger District

GUM RUN ROADLESS AREA

Scale

1:126,720

1/2 inch = 1 mile

N

Roadless Area

GUM RUN ROADLESS AREA

I. DESCRIPTION

Acres: approximately 12,585

Location and vicinity The area is located on the Dry River Ranger District, George Washington National Forest It is located in Rockingham County, Virginia to the south of U S highway 33 in the area surrounding Rawley Springs, Virginia With the exception of a short segment of the area's boundary on the southeast side, the area is bounded by either roads or private propoerty On the *north and northeast sides, the boundary follows private land The western boundary follows FDR 227 The southern boundary follows* FDR 225 and 225B In the southeast corner of the area, the boundary runs south from FDR 492 down a ridge to the east of Prospect Knob until it intersect FDR 225 where it turns east and follows the road

Describe access to the area including roads and trails leading to the area *The boundary can be accessed by the following roads* U S Highway 33, and Forest Roads 225, 225B, and 227 Forest Road 304 enters the area on the north end and runs approximately 2 miles into the heart of the area Each of these roads are open for public use on a year-round basis

The following Forest Service trails provide access

There are no system trails within the area There are a number of trails and old roads not on the Forest's official transportation system that exist throughout the area, including a trail that leads east from Maple Springs down Chesnut Ridge This particular trail receives *extensive illegal all-terrain vehicle use*

General description of the area's geography. The area lies within the Valley and Ridge Physiographic Province of Virginia It contains mountain ridges with parallel drainages in a contorted arraingement with spur ridges and associated small drainages leading down from the major ridges *The major ridges are Dundore Mountain, Goods Mountain, Riven Rock Mountain, Chestnut Ridge, and* an unnamed broad ridge in the southern portion of the area

General description of the area's topography. Elevations range from approximately 1,800 feet along U.S Highway 33 on the northeastern boundary to 3,570 feet at the top of Goods Mountain in the east-central portion A small neck of the area on the southwest side has an elevation of 4,000 feet Slopes vary from moderate to very steep and are dissected by numerous small and moderately sized streams

General description of the area's vegetation, including the ecosystem type. The area is entirely forested A mixed eastern hardwood forest containing mostly oaks and hickories occupies the north and east facing slopes and other moist sites The best sites, usually in the deeper, more moist drainages, contain cove hardwoods including black and red oak, birches, ashes and maples The poorest sites, on ridge tops and south and west facing slopes contain a mixture of oaks, yellow pines and white pines

Understory vegetation varies with aspect and moisture regime Riparian vegetation occurs along perennial and larger intermittent streams Dry sites contain fetterbush, scrub oaks, and yellow and white pine regeneration Intermediate sites contain pine and hardwood regeneration, understory tree species such as dogwood and black gum, laurel, and sparse amounts of herbaceous plants

Key attractions, if any, including sensitive wildlife and scenic landmarks There are no significant landforms, or other prominant features The land is generally steep and rugged, except for two broad ridges Sensitive wildlife species are black bear, which requires remote habitat and the Cow Knob Salamader, which is endemic to the higher elevations of Shenandoah Mountain, where it prefers late successional to old growth mixed hardwood forests

II INVENTORY

Human Influence

To what degree have humans and past and present human activity affected natural ecological processes and conditions? Except for the deeper, most rugged drainages, and the dry sites on flat ridges which contain scrub timber species, most of the area was cut over in the late 1800s and early 1900s The existing forest cover averages 90 years old The area burned frequently prior to government acquisition

About 40 acres on the extreme southeastern end area was harvested for fuelwood in 1983 About 60 acres was harvested on the western edge in Dunkel Hollow A timber sale of unknown size, but probably several hundred acres occurred on the southeast side

of Prospect Knob in the late 1960's There are about 15 grassy, man-made wildlife clearings and several man-made wildlife waterholes within the area

These activities have not affected natural ecological processes and conditions in the area to a significant degree

To what degree is the area natural or natural appearing and free from disturbance? Except for the recent timber harvest areas and wildlife improvements the area is natural appearing and relatively free from disturbance

Vehicles traveling Highway 33 and Forest Road 227 can be heard in the western portion and in the eastern and western portions of the area, respectively. Switzer Lake on the northwest border of the area is a water supply reservoir for the City of Harrisonburg, Virginia It has become a popular place for dispersed camping, picnicing and partying Noise from these activities can be heard in the extreme northwest portion of the area

If the area's ecological processes and/or natural appearance have been altered by past or present human activity, is the land regaining a natural, untrammeled appearance? Yes, except for the recent timber harvest, the area appears natural to the average visitor

Does the existing or attainable National Forest System ownership pattern, both surface and subsurface, ensure perpetuation of identified wilderness value? There are no apparent surface ownership patterns that would preclude perpetuation of wilderness values. Mineral rights on three tracts within the area are reserved in perpetuity. It is very unlikely that valuable subsurface mineral deposits exist However, there is a strong possibility that the area has shale and gravel deposits that could be commercially developed

Is more than 15 percent of the area in non-native vegetation? NO

Improvements, Structures, and Nonconforming Uses

Are any of the following types of areas, features or nonconforming uses present? If so, where?

Areas with evidence of historic mining at least 50 years old (Do not include areas of significant current mineral activity) NO

Areas under current mineral lease that contain a "no surface occupancy" stipulation. There are no valid leases currently in effect within the area.

Areas under current mineral lease where the leasee has not exercised development and occupancy rights There are no valid leases currently in effect within the area

Recreation improvements such as occupancy spots or minor hunting or outfitter camps: There are primitive, dispersed camping spots scattered throughout the area There are some markers and possibly a few information and education signs along trails within the area.

Timber harvest areas where logging and prior road construction are or are not evident. There are three timber harvest cutting units which have been logged since 1982 These units have revegetated, temporary roads and skid trail associated with them These harvest areas and associated roads and skid trails are visually evident

Some of the old access and logging roads built prior to government acquisition still exist These old roads are not maintainted but the roadways are still evident and are being illegally used by four-wheel drive and other all-terrain vehicles

Cultural treatments involving plantations or plantings: About 100 acres of timber harvest comprising three cutting units have been site prepared with the use of chainsaws since 1986

Private inholdings in the area. None The boundary lines have been drawn to exclude private land from the area

Dwellings on private inholdings: There are no private inholdings

Nonconforming structures and improvements: NONE

Ground-return telephone lines· There are none within the area

Watershed treatment areas: About 15 acres on the southeast side of prospect knob were re-vegetated as a watershed restoration project The area was reseeded in 1990

Roads· *The following Forest Service System Roads exist within the area* FDR 227D 0 9 *mile closed and re-vegetated* FDR 227H 1 1 miles closed and re-vegetated FDR 304 2 2 miles within the area are open to the public Where FDR 304 leaves U S Highway 33, it crosses property owned by the city of Harrisonburg The Forest Service does not have a right-of-way across this land FDR 492 This road enters the area from the eastern side The proposed boundary excludes the road by forming a narrow corridor into the area The road is 1.7 miles long and is open to the public Again, the Forest Service does not have a valid ROW across the private land where this road enters the area FDR 225 2 3 miles open for administrative use Uses same ROW as FDR 492

In addition to Forest Service system roads there are about 6 miles of old, open woods roads in the area that are not listed on the forest's official transportation system The system and other roads in the area are popular ORV routes and are frequently traveled Old logging roads in the southeast portion of the area receive lots of illegal ATV use

Can existing nonconforming uses be effectively mitigated or terminated through removal or rapid natural deterioration? It will be very difficult to eliminate the illegal ATV use in the area Several of the most heavily used trails come off adjoining private land

Are improvements in the area being affected by the forces of nature rather than humans, and are they disappearing or muted? The timber sale harvest areas of the 1980s are being managed through follow-up site treatments with chainsaws to assure adaquate regeneration Wildlife clearings are mowed every other year. Wildlife ponds receive maintenance to keep them functioning System roads within the area are either closed and re-vegetated or receive minimal, if any, maintenance Temporary roads in the area are periodically inspected and re-seeded All of the above improvements are evident If left to the forces of nature, these improvements would eventually become muted and disappear

III. EVALUATION

Capability

Does the area contain the basic characteristics that make it suitable for wilderness designation without regard to its availability for or need as wilderness? Consider the following characteristics in analyzing the quality of the wilderness resource. If these characteristics are determined to be important, describe and refer to them

Experiential benefits. Does that area provide the opportunity for solitude and serenity? The area is bordered on the north by U S Highway 33, a heavily traveled route The sounds of traffic on this road, as well as the sight of the road itself, are evident along the north end of the area There is a very narrow neck of land within the southwest corner of the area that is surrounded by open roads Within this area, the sights and sounds of traffic would be virtually impossible to escape Switzer Lake receives a lot of recreation use, including weekend parties that would be heard from within the area The private land at Maple Springs that adjoins the area on the southern end contains several dwellings that are visually evident Finally, both FDR 304 and 492 enter the area Traffic on these roads would be heard in many locations in the interior of the area

In summary, the area does not provide much opportunity for solitude and serenity

Challenge Does the area offer visitors the opportunity to experience adventure, excitement, challenge, initiative, or self-reliance. Is access easy or difficult? Access to the area will be from Forest Service system roads that border the area and trails within the area The area can be easily accessed

The area offers limited opportunities for adventure, exictement and challange

None of the area is more than 6 or 7 miles from a place of permanent human habitation

Outdoor Recreation Opportunities. What is the area's capability for providing primitive and unconfined types of recreation including:

Camping - There are numerous locations suitable for primitive camping

Hunting - The area is currently very popular for deer, bear, wild turkey and squirrel hunting

Fishing - There are native trout populations in Blacks Run and Gum Run which are among the best native trout streams on the District

Mountain Climbing - There are no known sites suitable for this activity

Ski Touring - The area is suitable for ski touring but inconsistent and sparse snowfall limit the scope of this activity There are other areas on the forest that offer better opportunities for this activity

Canoeing - There are no streams or rivers large enough to support this activity

Boating - There are no streams or rivers large enough to support this activity

River Rafting - There are no streams or rivers large enough to support this activity

Backpacking - The area offers some opportunities for short, one to three-day backpacking trips

Hiking - The area does not contain any trails that appear on the forest's trail inventory There are, however, some old trails and roads that are suitable for hiking There are ample opportunities for cross-country travel Relative to other areas on the forest, this area ranks low in terms of hiking opportunities

Riding - Horseback riding on old roads and trails within the area is becoming increasingly popular The current trail system is suitable for day-trips and one night stays

Photography - There are no outstanding features in the area that make it any more suitable to photography than other areas of the forest

Special Features:

What is the area's capability to provide outdoor education and scientific study, both formal and informal, in a manner compatible with wilderness? The area is typical of the George Washington National Forest in terms of its opportunities to provide for education and scientific study

Is there an abundant and varied wildlife population? The area supports black bear, white-tailed deer, wild turkey, squirrels and a number of other game and non-game species typical of the Mid-Appalachian region

The Cow Knob salamander, endemic to Shenandoah Mountain, inhabits the higher elevations of this area Red crossbills, a very rare species in Virginia, use yellow pine areas, particularily where table mountain pine grows Other rare species may inhabit the area, but a complete flora and fauna survey has not been conducted

Manageability.

What are the characteristics of the surrounding area including ROS classification, adopted VQO, and present and planned uses? The area is entirely surrounded by land invnetoried as roaded natural

Much of the area and the surrounding lands are assigned a visual quality objective (VQO) of modification Exceptions to this occur along a narrow strip of land boundering U S Highway 33 where the assigned VQO is retention and on lands bordering Switzer Lake and leading up to Goods Mountain where the assigned VQO is partial retention

Do boundary locations conflict with important existing or potential public uses outside the boundary that might result in demands to allow nonconforming structures and/or activities in the wilderness? As the area's population grows, there will be increasing development pressures on those private lands along U S Highway 33 and that make up the northern boundary of the area The City of Harrisonburg takes water from Dry River near Riven Rock While there are currently no plans to upgrade the water delivery system, an expansion of the water delivery system could affect lands inside the boundary

There are a number of dwellings on the tract of private land called Maple Springs just outside the southern boundary of the area Much of the illegal motorized use of the area originates from this area Further development of this private land would increase pressure on the area

FDR 304 is an open system road that currently enters the heart of the area This allows motorized use within the area that is incompatible with a wilderness designation FDR 492 also bisects the area and, although there is a corridor surrounding it that excludes it from the area, the road presents a problem for management as it provides ample opportunities for illegal motorized use of the area

Is it possible to readily and accurately describe, establish, and recognize boundaries on the ground? Generally the boundaries could be readily and accurately established on the ground Boundaries adjoin private and City of Harrisonburg land on the north and east sides of the area The remainder of the area is bordered by public roads

Do boundaries, where possible, conform with terrain or other features that constitute a barrier to prohibited use? No, the boundaries, as proposed, follow roads and private land boundaries There are not sufficient natural barriers to prevent or prohibit illegal uses

Do boundaries, to the extent practicable, act as a shield to protect the wilderness environment inside the boundary from the sights and sounds of civilization? Because the boundaries often follow roads, they do not adequately protect the wilderness environment from the sights and sounds of man

Do boundaries provide adequate opportunity for access and traveler transfer facilities? YES

If the area contains less than 5,000 acres.

Due to physiography or vegetation, is the area manageable in its natural condition? With the closure of FDR 304 and FDR 492, the area could be better managed in its natural condition Increased law enforcement of the area would be necessary to curtail illegal motorized use of the area

Is the area contiguous to existing wilderness, primitive areas, administration-endorsed wilderness, or roadless areas in other Federal ownership? No, with the exception of a small part of the area on the southeast corner, the Gum Run area is completely surrounded by roads and/or private lands

Availability:

Describe other (nonwilderness) resource demands and uses:

Recreation - The interior region is used for hiking, hunting, dispersed camping, horesback riding, mountain bike riding, stream fishing, berry picking, sight seeing, and illegal ORV and ATV travel

Information on Wildlife Species, Populations, and Management Needs - The area contains game and non-game species commonly found in the Mid-Appalachian region Many popular game species would benefit from habitiat manipulation to provide openings in the mature forest canopy Use of prescribed fire and timber harvest would be an appropriate method of accomplishing these needs

Water Availability and Use - Black Run and Gum Run both support a native trout fishery In the higher elevations, seeps and scattered springs are the only water sources All drainages contain either perennial or intermittent streams

Water in the streams is not safe for human consumption since it may contain various aquatic parasites that cause distress to humans Water taken directly from springs and seeps may not contain these aquatic parasites

The western portion forms a part of the municipal water supply for the City of Harrisonburg Switzer Lake, just outside the area is the impoundment for the city of Harrisonburg

Livestock Operations - NONE

Timber - Due to the steep terrain and lack of existing interior roads the area is not well suited to any large-scale commercial timebr production Many of the drainages contain high quality sawtimber that could be accessed through the construction of relatively expensive, mid-slope roads skid trails Demand for these products does exist within the broader market area of the George Washington National Forest

Minerals - The mineral potential of the area is not fully known There is no indication that the area has potential for mineral development To date, little interest has been shown for any activity other than leasing for oil and gas exploration No active

exploration has taken place within the area A gas well exploration site exists on Meadow Knob immediately adjacent to the boundary Data from this test site is not available No mineral activity has taken place in the Gum Run area during the 1980's

Cultural Resources - Most of this area is dry, steep, rugged terrain that would have afforded little opportunity for prehistoric or historic settlement Exceptions to this statement include floodplains and terraces along the perennial streams that drain the area Both prehistroic and historic sites may occur on those land forms The upper elevations are less likely to contain prehistoric sites unless a source of perennial water is found near any flats Rock shelters have been discovered in the eastern portion of this area The shelters have not been tested, and there is no determination if they were inhabited

Rawley Springs was a former resort that is located within the vicinity of this area There may have been some historic use of the current Forest land as a result of the resort Field surveys would be necessary to determine the presence of historic sites within the roadless area

Authorized and Potential Land Uses - There are no authorized special land uses in the area at this time

Management Considerations Including Fire, Insects and Diseases, and Presence of Non-Federal Lands The area will probably be defoliated by the gypsy moth within the next 5 years The Southern pine beetle is currently endemic, but populations are building yearly

There have been no recent large, human-caused fires within the area

Wilderness designation could make wildfire suppresion more difficult, as mechanized equipment is not allowed in the wilderness under most circumstances Since wildfire has been agressively suppressed starting with government acquisiton of the land, fuel loadings are fairly high This could result in relatively intense fires in the area If substantial mortality results from gypsy moth defoliation, this could result in even higher fuel loadings

What outputs are currently produced or could be produced in the future? The area provides good opportunities for hunting, especially for deer, bear, turkey and squirrel

There is some good quality hardwood sawtimber and pine pulpwood in the area

Is the area located such that the need for increased water production and/or additional onsite storage is so vital that installation or maintenance of improvements is an obvious and inevitable public necessity? No, the area is not located such that it is in an area that is, at the present time, vital to water needs of the public Switzer Lake provides water for the City of Harrisonburg If the need arose to increase the size of this reservoir or the water delivery system, a portion of the area might be affected

Would wilderness designation seriously restrict or prevent the application of wildlife and/or threatened and endangered plant or animal management measures of considerable magnitude and importance? No, but many popular game species in the area would benefit from habitiat manipulation such as timber harvest to create openings in the canopy and/or prescribed burning

Is it a highly mineralized area of such strategic or economic importance and extent that restrictions or controls due to wilderness designation would not be in the public interest? NO

Does the area contain natural phenomena of such unique or outstanding nature that general public access and special development to facilitate public enjoyment should be available? NO

Is the land needed to meet clearly documented resource demands such as for timber, mineral production, or developed recreation? NO

Is the land committed through contractual agreements for use, purposes, or activities not in concert with wilderness requirements? Mineral rights have been reserved in perpetuity on the following tracts S-30f, G-1554e, and G-1554g

<u>Need</u>

Other Wildernesses·

How far is it to the closest existing wilderness? Ramseys Draft wilderness is approximately 10 miles south of the Gum Run area

What level of use currently exists in near-by existing wilderness? What trends exist in the use of these areas? According to Recreation Information Management (RIM) use records from 1989, there were a total of 3,100 recreation visitor days of use in Ramseys

Draft Trends indicate a steady increase in use of the area Impacts from this use are starting to show up in campsites along Ramseys Draft creek and in the wilderness close to the Mountain House recreation area.

Is the population in and around these areas increasing or decreasing? How quickly is it increasing or decreasing? The Gum Run area is in Rockingham county, Virgina Rockingham's population increased from 57,038 to 67,133, at an annual rate of 0 7 percent between the years 1980 and 1990 In Augusta county to the south, the population increased at an annual rate of 0 5 percent, from 53,732 to 56,315 between 1980 and 1990 In Shenandoah county to the north, there was an increase in population from 27,559 to 30,322 betweem 1980 and 1990, an annual percentage increase of 1 0 percent

To the west, the population in Pendleton county, West Virginia increased from 7,910 to 7,997, a 0 1 percent annual rate of increase between 1980 and 1990

Within the state of Virginia, the population increased at an annual rate of 1 4 percent between 1980 and 1990 This figure is significant in light of survey results that indicate that many of Virginia's wilderness users travel a considerable distance to visit these areas

Nonwilderness Lands:

Are there opportunities for unconfined and primitive recreation experiences on nonwilderness areas in the vicinity? If so, where? Yes, there are numerous and better opportunities for unconfined and primitive on nonwilderness area in the vicinity of Gum Run Better opportunities exist to the south of Gum Run in the Little River area as well as to the west in the Skidmore and Dry River areas

Habitat

Are there any biotic species in the area that are directly competing with increasing public use and development? Black bear and wild turkey populations in the area are both affected by increasing public use, especially illegal motorized use.

The demand for motorized recreation and developed recreation sites offering an increased variety of activities is increasing The demand for permitted special use events, primarily motorized recreation events, is also increasing.

With an increasing interest in all types of activities on the Forest, biotic species requiring solitude become increasingly vulnerable to disturbance from humans

Could their needs be provided for through means other than wilderness designation? Yes, the needs of unique, sensitive, threatened or endangered species within the area could be met through establishment of Research Natural Areas, Special Management areas, or by allocating the area to a management prescription specifically designed to protect the needs of these species

The George Washington National Forest is cooperating with the U S Fish and Wildlife Service in developing a conservation strategy for the Cow Knob salamander in the form of a pre-listing recovery plan This plan will specify standards by which the area will be managed to ensure the viability and long conservation of this species

Is there a need to provide a sanctuary for biotic species that cannot survive in less than primitive surroundings? This is unknown at this time However, studies and data collection are being conducted at this time to determine the habitat needs of many of these species

George Washington National Forest
Deerfield Ranger District

JERKEMTIGHT ROADLESS AREA

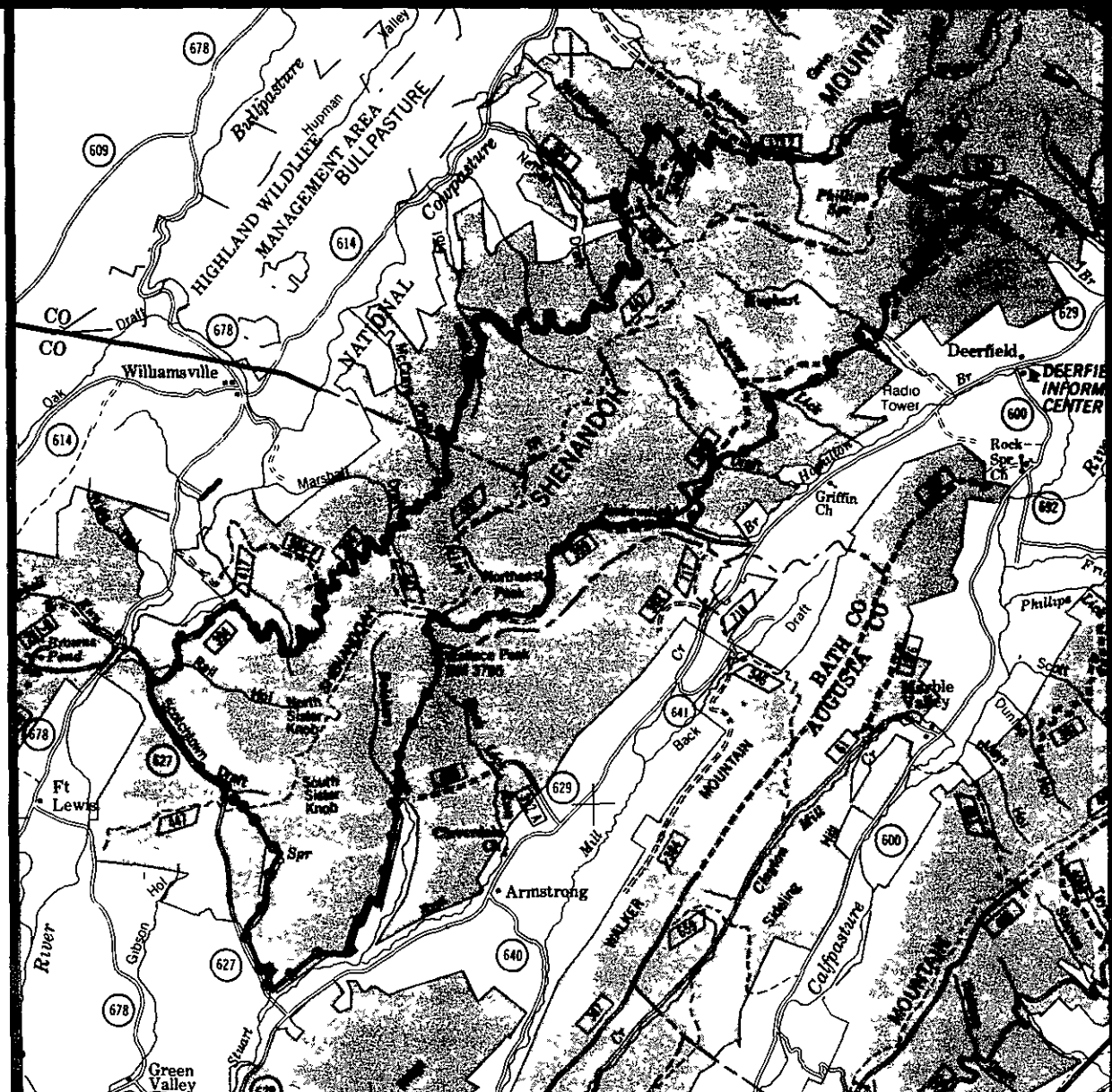
Scale

1:126,720

1/2 inch = 1 mile

N

Roadless Area



JERKEMTIGHT ROADLESS AREA

I DESCRIPTION

Acres· approximately 16,668

Location and vicinity. Jerkemtight is located on the Deerfield Ranger District, George Washington National Forest about 20 miles west of Staunton, Virginia on Shenandoah Mountain It occupies portions of Bath, Highland, and Augusta Counties and is situated between the communities of Williamsville and Deerfield

Describe access to the area including roads and trails leading to the area. The primary access to Jerkemtight is Jerkemtight Road, Forest Development Road (FDR) 399, which runs from State Route 629 to the top of Wallace Peak located along the boundary near the center of Jerkemtight The west boundary is accessable along the Sugartree Road (FDR 394) The northern boundary can be reached by Benson Run Road, FDR 173 The southern boundary is accessible by Scotchtown Draft Road, State Route 627

Sugartree Road, Benson Run, Scotchtown Draft, and Jerkemtight Roads are open year-round to public vehicle traffic Forest Service Roads 399B, 394B, and 393 are open seasonally for hunting and are available for firewood gathering (dead and/or down timber)

The Shenandoah Mountain Trail (447) runs along the top of the mountain and traverses the entire Jerkemtight Roadless Area from north to south The Marshall Draft Trail (547) and the Nelson Draft Trail (393) provide access into Jerkemtight from the west by connecting Sugartree Road to the Shenandoah Mountain Trail on top of the mountain

General description of the area's geography. Jerkemtight encompasses Shenandoah Mountain which lies within the Allegheny Mountains of the Appalachian Mountain Range It is within the Ridge and Valley Physiographic Province of Virginia

General description of the area's topography Shenandoah Mountain is situated on a northeast to southwest orientation within Jerkemtight The primary peaks along the crest of Shenandoah Mountain include The Bump, Northeast Peak, Wallace Peak, North Sister Knob, and South Sister Knob Approximately half of Jerkemtight has steep slopes exceeding 50 percent Elevations range from approximately 1,700 feet to 3,811 feet at Northeast Peak, the highest point in the Jerkemtight Roadless Area

Watersheds are mainly small first- to third-order streams with steep V-shaped drainages These streams are generally intermittent with only the lower reaches of many streams becoming perennial Streams on the east side of the mountain drain into the Calfpasture River, and streams on the west into the Cowpasture River, both part of the James River Drainage The terrain in Jerkemtight is very similiar to the rest of the National Forest land in the Ridge and Valley Province of the Alleghany Mountains

General description of the area's vegetation, including the ecosystem type. The predominate forest types in Jerkemtight are mixed hardwoods and hardwood-pine The hardwood forests consist mostly of upland oaks and hickory which typically occur on northwest to southeast facing slopes On the upper slopes, these forests are mostly smaller trees with major species of black oak, chestnut oak, scarlet oak, and hickory On the lower slopes and in the drainages, larger-sized trees are present The primary species in the drainages are red oak, white oak, yellow poplar, white pine, hemlock, and a few sugar maple

The hardwood-pine forests generally occur on high, dry ridges and on the south- to west-facing slopes Species are upland oaks mixed with patches of Table Mountain pine, pitch pine, and Virginia pine These are generally stands of smaller sized trees with dense understories of mountain laurel, huckleberries, and bear oak

The understory density varies from fairly open, consisting mostly of dogwood, to very dense, consisting of mountain laurel and blueberries The primary understory species throughout the area are dogwood, red maple, black gum, striped maple, witchhazel, hickory, mountain laurel, black locust, huckleberries, and white pine

Key attractions, if any, including sensitive wildlife and scenic landmarks Shenandoah Mountain is Jerkemtight's primary attraction Approximately 22 miles of the mountain are encompassed in this roadless area This mountain is prominant and provides beautiful views of the valleys to the east and west The Shenandoah Mountain Trail runs along the crest of the mountain and is used primarily for hunting access The trail system receives light use outside of hunting season Use by hikers and horseback riders appears to be increasing slightly

The Virginia Department of Conservation and Recreation, Division of Natural Heritage, has proposed a Special Management Area (Sister Knobs) which is located in the southwest part of Jerkemtight around North and South Sister Knobs This area consists of approximately 665 acres According to the Division of Natural Heritage, this part of Shenandoah Mountain contains exemplary natural communities and sensitive plant species including shale barrens and associated vegetation Some of the best populations of the

Federally Endangered, shale barren rock cress (Arabis serotina), are reported to occur in Sister Knobs The area is reported to be one of the best areas to provide long-term research and protection for shale barrens and shale ridge balds

II. INVENTORY

Human Influence

To what degree have humans and past and present human activity affected natural ecological processes and conditions? Jerkemtight has had little human intrusion in the past 80 to 100 years Except for some inaccessable areas, much of Jerkemtight was logged during the 1800s and early 1900s More recent timber harvest has occured on a very limited scale, with the greatest impact by 5 to 10-year-old clearcuts located along the fringes of Jerkemtight The areas with heavy timber harvest during the last 10 to 20 years have generally been excluded and are outside the boundaries of Jerkemtight

To what degree is the area natural or natural appearing and free from disturbance? Jerkemtight has regained a natural appearance with little indication of past disturbance Ecological processes are mostly stable

Modern man's impact is not evident deep within Jerkemtight, but is concentrated along the fringes Man's impact is most evident from timber harvest and road construction in adjacent areas outside of the Jerkemtight boundaries

If the area's ecological processes and/or natural appearance have been altered by past or present human activity, is the land regaining a natural, untrammeled appearance? The natural regenerative ability of the forest has restored Jerkemtight The old logging impacts are not apparent

Does the existing or attainable National Forest System ownership pattern, both surface and subsurface, ensure perpetuation of identified wilderness value?

The Federal Government owns all surface rights in Jerkemtight Private mineral rights have been reserved on one 182-acre tract and are outstanding on two large tracts that lie partially (approximately 184 acres) within the roadless area All three tracts are located near the northwestern boundary of Jerkemtight The 185-acre tract with reserved mineral rights lies southwest of "The Bump" The portions of the two tracts with outstanding mineral rights lie northwest of "The Bump"

Is more than 15 percent of the area in non-native vegetation? No The only known non-native vegetation are grasses that have been used to revegetate disturbed areas and a few red spruce which have been planted around Wallace Peak

Improvements, Structures, and Nonconforming Uses

Are any of the following types of areas, features or nonconforming uses present? If so, where?

Areas with evidence of historic mining at least 50 years old (Do not include areas of significant current mineral activity): NONE

Areas under current mineral lease that contain a "no surface occupancy" stipulation· NONE

Areas under current mineral lease where the leasee has not exercised development and occupancy rights· NONE Jerkemtight had been under oil and gas leases in the past, but no known exploration has been done

Recreation improvements such as occupancy spots or minor hunting or outfitter camps. NONE Recreation improvements consist mainly of primitive dispersed hunter camps which are located along all the roads surrounding Jerkemtight

Timber harvest areas where logging and prior road construction are or are not evident: Limited timber management and road construction activity has occurred in Jerkemtight Most of this activity is located on the lower elevations along the edges of Jerkemtight Most harvest units are about 5 to 10 years old A few stands were harvested in approximately 1967 near the top of the mountain in the vicinity of 'The Bump' in the northern part of Jerkemtight The roads used to log these areas have been revegetated but are also evident

Cultural treatments involving plantations or plantings. Most of the harvest areas were allowed to regenerate naturally, with only a few units having been planted with white pine

In association with the timber harvest activity, several wildlife clearings and waterholes have been developed The area contains approximately 8 permanent openings and 6 permanent waterholes

Private inholdings in the area· NONE

Dwellings on private inholdings: NONE

Nonconforming structures and improvements: NONE

Ground-return telephone lines: The Mountain Grove-Williamsville telephone company has a telephone line along Scotchtown Draft (State Route 627) on the Jerkemtight boundary

Watershed treatment areas: NONE

Roads: There are no improved roads within Jerkemtight

Can existing nonconforming uses be effectively mitigated or terminated through removal or rapid natural deterioration? The boundary along the Scotchtown Draft Road can be adjusted to eliminate the telephone line

Are improvements in the area being affected by the forces of nature rather than humans, and are they disappearing or muted? The impacts from past timber harvests are being mitigated naturally by regeneration and growth of the new stands The existing wildlife improvements (openings and waterholes) could also be mitigated through time by eliminating maintenance and letting these *areas revert back to native vegetation*

A few old logging roads are present in Jerkemtight They are revegetated and only portions are evident to the casual observer These *old woods roads could be used as hiking trails by blocking to vehicle use They are primarily used by hunters and firewood gathers*

III. EVALUATION

Capability

Does the area contain the basic characteristics that make it suitable for wilderness designation without regard to its availability for or need as wilderness? Consider the following characteristics in analyzing the quality of the wilderness resource If these characteristics are determined to be important, describe and refer to them.

Experiential benefits Does that area provide the opportunity for solitude and serenity? Limited trails, steep terrain and low visitation translate into good opportunities for solitude

Challenge. Does the area offer visitors the opportunity to experience adventure, excitement, challenge, initiative, or self-reliance. Is access easy or difficult? It is approximately 22 miles on the Shenandoah Trail from the northeast to southwest boundaries of Jerkemtight The length of trail can provide a sense of challenge and adventure After several miles of hiking a sense of solitude and serenity can easily be felt

Outdoor Recreation Opportunities. What is the area's capability for providing primitive and unconfined types of recreation including

Camping - Sugartree Road, Benson Run Road and Scotchtown Draft have many small dispersed camping areas available that receive heavy use during hunting season
The interior of the area offers ample opportunities for challenge and adventure

Hunting - Hunting pressure is heavy in Jerkemtight and is the major use The Jerkemtight Road provides access for 4x4's and ATV's to the top of Wallace Peak and is also a popular area for hunters

Fishing - Benson Run, located along the northern boundary, contains native brook trout. It is not heavily fished

Mountain Climbing - NONE

Ski Touring - Some potential exists for cross country skiing, but it is limited due to inconsistent snowfall, narrow trails and steep side slopes

Canoeing - NONE

Boating - NONE

River Rafting - NONE

Backpacking - Jerkemtight offers excellent opportunities for backpacking

Hiking - Jerkemtight offers excellent opportunities for hiking.

Riding - There is some horseback riding on the fringes of Jerkemtight and along Shenandoah Mountain Trail

Photography - Opportunities for outdoor photography are good

Special Features.

What is the area's capability to provide outdoor education and scientific study, both formal and informal, in a manner compatible with wilderness? Due to minimal recent management activity in Jerkemtight, an opportunity for ecology study focusing on vegetation, wildlife and watershed is provided

Is there an abundant and varied wildlife population? Jeremtight exists in a natural state with abundant plant and wildlife species represented

Manageability·

What are the characteristics of the surrounding area including ROS classification, adopted VQO, and present and planned uses? Recreation Opportunity Spectrum (ROS) classification for the surrounding National Forest land is roaded natural to the south and west, roaded natural and semi-primitive motorized to the north and east A classification of rural has been allocated around Williamsville to the west and in the Deerfield Valley to the east The community of Deerfield has a classification of urban

Visual Quality Objectives (VQO's) for the surrounding land is mostly Modification with areas of Partial Retention along the major highways and Cowpasture River

Do boundary locations conflict with important existing or potential public uses outside the boundary that might result in demands to allow nonconforming structures and/or activities in the wilderness? The three small tracts with reserved minerals located in the norwestern corner of Jerkemtight could cause some problems with nonconforming activities if the private owners chose to exercise their minerals rights

There are no other known conflicts with boundary locations and existing or potential public uses in the vicinity Some potential may exist for nonconforming activity in the southern corner which adjoins private land This private land also blocks public access along 4 miles of the boundary

Is it possible to readily and accurately describe, establish, and recognize boundaries on the ground? The boundaries of Jerkemtight are located mostly on existing roads The southern corner bounds on private land The boundary from Wallace Peak south to private land follows a major ridge line These boundaries would be easily described, established, and recognized on the ground A few short stretches will be difficult to locate and recognize These include about two miles of a cross country line from a private inholding back to Scotchtown Draft Road on the southwest edge, about three miles along the north corner where the 2400 foot contour forms the boundary between Forest Service 394B and Benson Run Road, and about one and one-half miles along the northeast where the 2200 foot contour connects Forest Service Road 399B to private land

Do boundaries, where possible, conform with terrain or other features that constitute a barrier to prohibited use? Access into Jerkemtight is easy from the existing roads that form its perimeter The Jekemtight Road goes to the top of Wallace Peak and provides the easiest access to the interior of the area The Shenandoah Mountain Trail provides good access to the interior from its intersections with Benson Run Road on the north and Scotchtown Draft Road on the south Access to the top of the mountain from the remainder of the southeast and northwest boundaries is difficult due to the long climb up very steep slopes

The boundary road system does not provide much of a barrier to prohibited use Easy access may encourage prohibited activity such as use of motorized equipment Easy access will also facilitate signing and law enforcement

Manageability of Jerkemtight could be improved by deleting the southern part between Wallace Peak and Scotchtown Draft Road Jerkemtight comes to a bottleneck near Wallace Peak and is less than 1 mile wide Breaking the area between the end of Jerkemtight Road and the Marshall Draft Trail would eliminate this narrow area and would reduce the possibility of encroachment by non-conforming use This would also eliminate the potential problems along private land at the south end Deleting this area would also keep the proposed Special Management Area out of Wilderness consideration Keeping the SMA as a separate entity could facilitate consideration of this area as a research property, and would keep research options open This would allow management activity for research if needed

Do boundaries, to the extent practicable, act as a shield to protect the wilderness environment inside the boundary from the sights and sounds of civilization? Since Jerkemtight encompasses Shenandoah Mountain, it is long and narrow in shape In reality, the Shenandoah Trail is never more than two miles from an existing road It is probably impossible to get totally away from the sounds and sights of man

The Air Force practices fly-over exercises over Jerkemtight These are low altitude flights that have been observed following the Cowpasuture River on the west side of Jerkemtight, often lower than the top of Shenandoah Mountain The extremely loud noise from the Air Force jets conducting low level flights over Jerkemtight is expected to continue for the forseeable future

Do boundaries provide adequate opportunity for access and traveler transfer facilities? The existing road system which forms the boundary will provide excellent opportunity for public access and traveler transfer facilities

Availability

Describe other (nonwilderness) resource demands and uses:

Recreation - Hiking and hunting in a primitive setting opportunities are readily available in Jerkemtight A limited amount of dispersed camping occurs within Jerkemtight along the Shenandoah Mountain Trail There is a significant amount of camping by hunters along the perimeter on Scotchtown Draft, Benson Run, Jerkemtight, and Sugartree Roads Several old woods roads coming off private land on the southeast and northeast are used by adjacent landowners to gather firewood and for hunting access

Information on Wildlife Species, Populations, and Management Needs - Jerkemtight contains deer, bear, turkey, grouse, squirrel and non-game species Populations of these species are similiar to that found in other wooded areas in the county

Many wildlife openings and waterholes are maintained along the perimeter of Jerkemtight Several maintained openings are located well within Jerkemtight at Hugart Run and along the north end of Sugartree Road More wildlife improvements will be planned in conjunction with future timber sales

Water Availability and Use - Water is scarce at the higher elevations

Livestock Operations - NONE

Timber - Site indexes vary form an occasional site 80 for oak in the moist drainages to site 40 or less on the higher slopes An overall site index is generalized to be site 60 for oak Most of the trees in Jerkemtight are in excess of 60 years of age

Minerals - NONE

Cultural Resources - The relatively dry, steep, rugged terrain would have effectively presented a barrier to long-term occupation of most of this area There may have been some prehistoric travel along the crest of Shenandoah Mountain, but camping locales would have depended on the presence of a reliable water source There may also be either historic or prehistoric sites along any floodplains, fans, or terraces adjacent to the larger streams draining the area after they become perennial This latter statement would apply more to the southern portion, including Jordan Hollow, Rail Hollow, and Scotchtown Draft

Authorized and Potential Land Uses - NONE

Management Considerations Including Fire, Insects and Diseases, and Presence of Non-Federal Lands - Fires have occurred within the area over the years but have done little damage within the last 50+ years Some timber is dying due to old age and oak dieback is very prevelant in oak stands Pockets of dead yellow pine are evident on some of the ridges from past southern pine beetle injury These small areas have generally become naturally restocked with pine Some areas of timber were blown down during Hurricane Hugo in 1989 including scattered trees along the top of the mountain. Many of these were across the Shenandoah Mountain Trail The entire 22 mile trail through the area was cleared with chainsaws during the fall of 1990 Male Gypsy Moths have been trapped in the area for the last two years under the AIPM program. It is expected to defoliate the area within the next 5 to 10 years

Illegal use of ATV's has been a problem on the Shenandoah Mountain Trail This has occured mostly during hunting season The two biggest problem areas are at the trail intersections with Scotchtown Draft Road and Jerkemtight Road Information and Education (I&E) programs, as well as issuing several violation notices, has reduced this problem but has not eliminated it Continued I&E is needed Increased signing or boundary posting, construction of additional barricades, and increased law enforcement may be needed to eliminate this use

What outputs are currently produced or could be produced in the future? Based on stand records, approximately 61 percent of the area (10,400 acres) is suitable for timber production The potential to produce timber in the area is good, but timber management opportunities have been limited due to steep slopes and lacke of acces The largest loss in timber production potential would be on the lower slopes along the fringes of the area which can be easily reached from the existing road system

There is a timber sale (Rock Hill) planned adjacent to Scotchtown Draft and Sugartree Roads within the next five year period. Planned activities could exclude system road construction within Jeremtight, but several units are planned just inside the boundaries in the northwest corner of this roadless area

Is the area located such that the need for increased water production and/or additional onsite storage is so vital that installation or maintenance of improvements is an obvious and inevitable public necessity? NO

Would wilderness designation seriously restrict or prevent the application of wildlife and/or threatened and endangered plant or animal management measures of considerable magnitude and importance? A Virginia Division of Natural Heritage report states that Sister Knobs contains " habitat for two populations of shale-barren rockcress, Arabis serotina, a Federal and State Endangered Spcies which is known from only 29 other populations in the world "

The shale barren habitats which occur around North and South Sister Knobs need to be protected in a natural state until final determination on the ecological significance and research potential is made Research results will be needed to determine how this plant's habitat should be managed

Is it a highly mineralized area of such strategic or economic importance and extent that restrictions or controls due to wilderness designation would not be in the public interest? NO

Does the area contain natural phenomena of such unique or outstanding nature that general public access and special development to facilitate public enjoyment should be available? NO

Is the land needed to meet clearly documented resource demands such as for timber, mineral production, or developed recreation? NO

Is the land committed through contractual agreements for use, purposes, or activities not in concert with wilderness requirements? NO

Need

Other Wildernesses.

How far is it to the closest existing wilderness? There are four designated wildernesses in the general vicinity Rich Hole Wilderness is 20 miles to the south, Rough Mountain Wilderness is 20 miles to the southwest, Ramseys Draft Wilderness is 7 miles to the north, and St Mary's Wilderness is 28 miles to the southeast

What level of use currently exists in near-by existing wilderness? What trends exist in the use of these areas? According to Recreation Information Management use records, there were a total of 3,000 visitor days recorded in Ramseys Draft Wilderness in 1989 Trends indicate a steady increase in use of Ramseys Draft has occured over the past several years

Is the population in and around these areas increasing or decreasing? How quickly is it increasing or decreasing? Jeremtight is located in Highland, Augusta and Bath Counties in Virginia The population in Highland and Bath Counties decreased between 1980 and 1990 while Augusta County's population increased at a modest rate

Studies of visitors to the St Marys wilderness on the Pedlar Ranger District have indicated that the visitors often travel up to 100 miles to get to the area In light of this, it is useful to look at the population of the state of Virginia and West Virginia Between 1980 and 1990, the population of the State of Virginia increased at an annual rate of 1 4 percent while the population for the state of West Virginia decreased at an annual rate of 0 4 percent

Nonwilderness Lands

Are there opportunities for unconfined and primitive recreation experiences on nonwilderness areas in the vicinity? If so, where? Douthat State Park is approximately 20 miles to the southwest of Jerkemtight The Shenandoah National Park is located about 35 miles to the east These parks provide for primitive recreation experiences as well as developed recreation.

There are many areas of National Forest land in the area that provide opportunities for unconfined and primitive recreation experiences Similar experiences can be found on the several state wildlife management areas located nearby

Habitat

Are there any biotic species in the area that are directly competing with increasing public use and development? There are no known biotic species in the area that are directly competing with increasing public use and development

Could their needs be provided for through means other than wilderness designation? NOT APPLICABLE

Is there a need to provide a sanctuary for biotic species that cannot survive in less than primitive surroundings? There is not a need to provide a sanctuary for biotic species that cannot survive in less than primitive surroundings

George Washington National Forest
Pedlar Ranger District

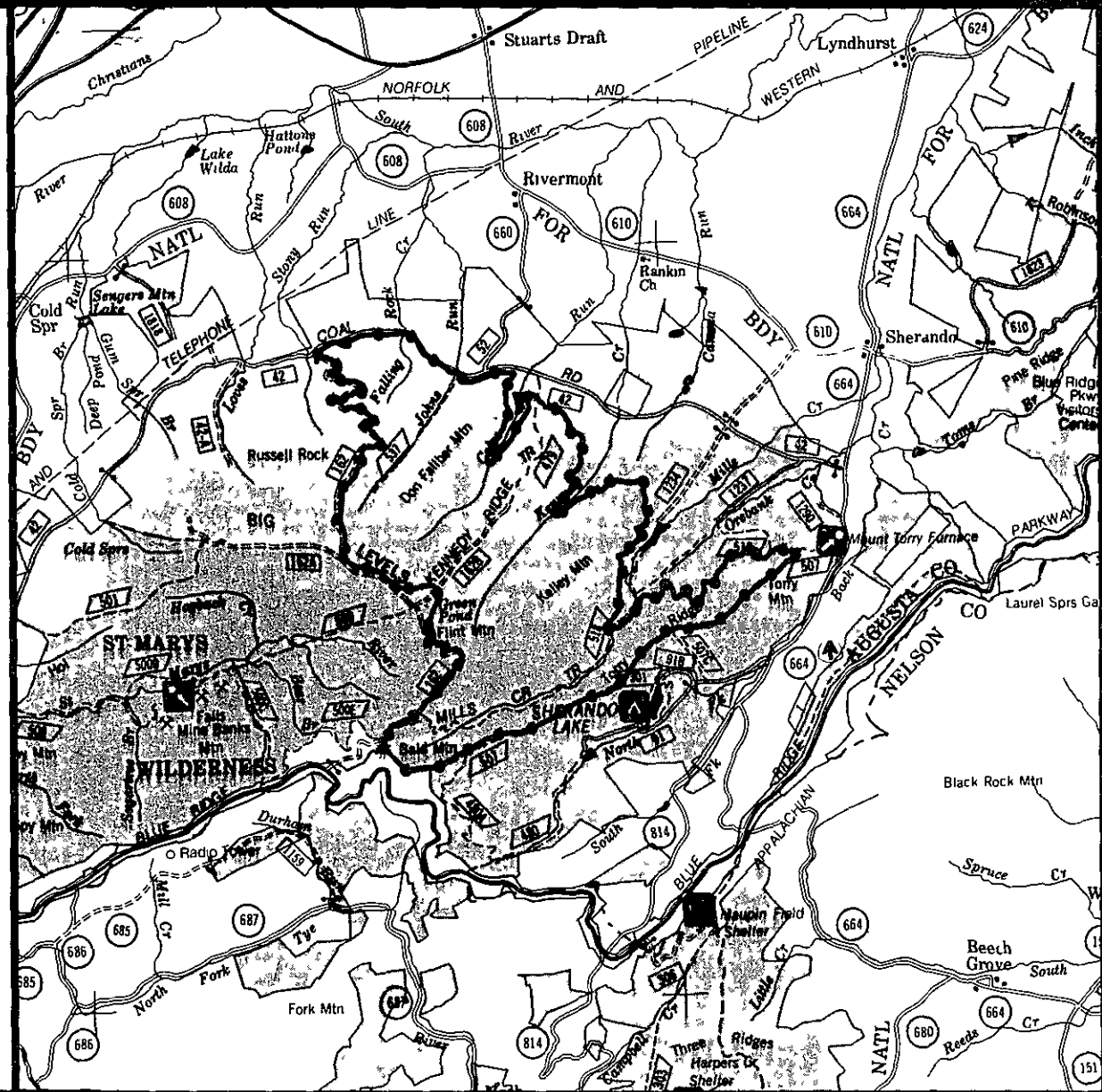
KELLY MOUNTAIN ROADLESS AREA

Scale

1:126,720
1/2 inch = 1 mile

N

Roadless Area



KELLEY MOUNTAIN ROADLESS AREA

I. DESCRIPTION

Acres: approximately 7,632

Location and vicinity. The Kelley Mountain area is within "Big Levels Area" in the southeast corner of Augusta County, Virginia, Pedlar Ranger District, George Washington National Forest Waynesboro and Staunton are 15 miles north, while Lexington and Buena Vista lie 20 miles south

The western boundary follows forest development road (FDR) 162, the Big Levels road known locally as Stony Run jeep trail, from FDR 42 on the north end to FDR 162C near the south end, thence along FDR 162C a short distance to the Blue Ridge Parkway/NF Boundary, thence along this boundary to the Torry Ridge Trail (FDT 507), and then northeasterly along FDT 507 to Mills Creek Trail (FDT 518) From the junction of FDT's 507 and 518 the boundary follows the 2,040 foot contour to the northwest, dropping down to FDR 42, the Coal Road just to the east of the Cole's Run reservoir It then follows FDR 42 until it intersects again with FDR 162

The western boundary along FDR 162 excludes Green Pond because of road reconstruction changes in 1986 A "peninsula" of land between FDR 162C and the Blue Ridge Parkway was not included because it is less than 1/8-mile wide and could not be effectively managed as wilderness

Describe access to the area including roads and trails leading to the area. The area is accessible by the Blue Ridge Parkway and from secondary roads off Interstates 64 and 81 Roads which give relatively close or direct access to the boundary include FDR 42 (Old Coal Road), FDR 162 (Big Levels), FDR 162C (Lookout), FDR 1237 (Turkey Pen Ridge), FDR 1234 (Mills Creek Dam), and the special use road to Coles Run reservoir These routes are seasonally closed, except for the final two, Coles Run and Mills Creek roads, which are open only for administrative use

Forest Development Trails (FDT) which provide boundary access are FDT 507 (Torry Ridge), FDT 507A & C (Blue Loop System from Sherando Lake), and FDT 518 (Mills Creek)

Interior roads and trails are as follow FDR 162B (Green Pond Road), FDT 479 (Kennedy Ridge Trail), FDT 537 (Johns Run Trail), and 518 (Mills Creek Trail) There are other miscellaneous old roads/trails used by sportsmen that exist in the area

General description of the area's geography. Kelley Mountain is part of the old Big Levels Wildlife Area west of Sherando, Virginia Big Levels is known for its somewhat isolated, flat or nearly level mountains west of the main Blue Ridge chain It is within the Blue Ridge physiographic province of the Appalachian Mountain System

A mild climate subject to considerable variations prevails The area experiences a number of winter storms, as well as tropical storms which occur during late summer and early fall Annual average precipitation is 38 inches, with local variations caused by the influence of the Blue Ridge mountains Rainfall, which historically averaged a pH of 5 6, is currently averaging in the low 4 pH range Average annual snowfall varies from 15 to 20 inches Due to the mountains, winds may be quite erratic but generally flow from southwest to northeast Winds frequently flow parallel to mountain ridges but are subject to seasonal influences Prevailing winds during the growing season are from the southwest and west, and from the northwest and north during cooler months

The area is underlain by a great diversity of rock types that owe their origin to a wide variety of sedimentary, igneous and metamorphic processes The Early Cambrian Antietam Quartzite underlies the area It consists of about 600 feet of uniform white to bluish gray sandstone and quartzite in beds 1 to 20 feet thick The Antietam Formation is divided into upper and lower units The lower unit is a clean massive, well indurated quartzite The upper unit generally consists of thin to medium bedded sandstones and quartzites that contain an abundance of iron oxide stains Kelley Mountain Area is possibly underlain by the upper unit of the Antietam Quartzite, it contains abundant trace fossils - Scolithus linearis The major structural feature is the Buena Vista anticline, part of a larger structural feature known as the Blue Ridge-Catoctin Mountain anticlinorium Therefore, the soils are formed on a variety of topographic landscapes and geologic parent material The Sherando-Monongahela soil association is found along the lower, flatter slopes, the Drall-Hazelton-Leetonia soil association is located on the upper, steeper slopes In general, the soils are from sedimentary quartzites, shales, sandstones, and some limestone They are medium to highly erodible and medium in moisture storage capacity Textures are mostly silt loams, loams, and sandy loams

General description of the area's topography Most of the area is rugged, rocky mountainous terrain with ridges running northeast-southwest in direction Elevations range from a low of about 1,700 feet along Coal Road to a high of 3,400 feet at Flint Mountain Mill Creek, Kennedy Creek, Coles Run, and Johns Run are the major drainages and are all tributaries of the South and Shenandoah Rivers of the Potomac River Basin

General description of the area's vegetation, including the ecosystem type. The area is entirely forested, the major cover types being chestnut oak, pitch pine/oak, pitch pine, and scarlet oak Most stands have a dense laurel, rhododendron, and/or bear oak understory with occasional blueberry, red maple, black gum, locust, serviceberry, sassafras, and dogwood Grape is present in the understory along the drains with hemlock and upland oaks in the main overstory The forest age is generally from 70 to 90 on slopes and ridges and 100 to 130 years in the main drainages

Biologically, this is an unique area that needs additional inventory Swamp Pink (*Helonias bullata*), listed as a Threatened species by the federal government, is located in Coles Run, Kennedy Creek, and Mill Creek drainages Rare sedges are also known to occur in the area The northern pine snake, a very rare species, probably occurs in the area There is also a high probability that rare invertebrates are located within the area

Key attractions, if any, including sensitive wildlife and scenic landmarks. The area is distinguished by its prominent mountain features The adjacent Green Pond Special Interest Area, Saint Mary's Wilderness, and the proposed Maple Flats Biological Area are considered unique, and contain several listed endangered, threatened and rare species A series of small waterfalls are located in the upper portion of Johns Run

The well known Mount Torry Furnace, listed on the National Register of Historic Places and as a Virginia Historic Landmark, is located outside the area on National Forest land along SR 664 Turn-of-the-century mines, such as the Mount Torry Mine along Orebank Creek and the Kennedy Mine near Kennedy Creek are located just north of the boundary

Domestic water is supplied by a lake on Coles Run The Mill Creek Reservoir is currently not used for domestic water, however, it is still under special use to the Augusta County Service Authority Both of these lakes are outside the northern boundary The popular Sherando Lake Recreation Area, the Blue Ridge Parkway, and the Shenandoah National Park are also reasonably close

The upper reaches of some streams contain small stands of virgin hemlock

II. INVENTORY

Human Influence

To what degree have humans and past and present human activity affected natural ecological processes and conditions? During the 19th century, there were at least five charcoal furnaces at the foot of the Big Levels Area Therefore, varying quantities of timber were cut for the charcoal needed in making pig iron After the iron furnaces closed down, fires burned the area almost annually until around 1924

The combination of timber cutting and uncontrolled fires left the area with little vegetative cover to prevent soil erosion The soils are low in natural fertility and organic matter content Forest Service management of the area began after its purchase between 1923 and 1925

In 1938, the Virginia Commission of Game and Inland Fisheries began a wildlife restoration program in cooperation with the Forest Service Deer and beaver were brought back as a result of a stocking program Turkey, bear, and a number of game and non-game species are present, largely due to conservation and forest management practices

Dispersed recreation activities - hunting, hiking, camping, and fishing dominate public land uses The boundary roads are heavily traveled by high clearance vehicles, and they are actively eroding ATV trespass frequently occurs

Timber activities have been rather limited Approximately 25 acres were dozed on Kennedy Ridge in 1963 to improve bear oak regeneration Also in 1962, the first cutting on the Pedlar District under the evenaged management system (clearcut method) was applied to about 17 acres near the Coal Road The area is now in chestnut oak/pitch pine poletimber During the 1980's approximately 54 acres were clearcut for natural regeneration Some site preparation efforts were accomplished with chain saws Annual maintenance has been performed since 1980 on the five wildlife openings

To what degree is the area natural or natural appearing and free from disturbance? The area appears relatively wild The evidence of man is still apparent but not dominant, even in areas where timber has been harvested

If the area's ecological processes and/or natural appearance have been altered by past or present human activity, is the land regaining a natural, untrammeled appearance? The area appears natural

Does the existing or attainable National Forest System ownership pattern, both surface and subsurface, ensure perpetuation of identified wilderness value? Mineral rights are outstanding on a total of 4,005 acres within Tract 160 for manganese and iron ore This is an area of known deposits for low grade ore, with possible historical mining in the area for iron ore

Is more than 15 percent of the area in non-native vegetation? NO

Improvements, Structures, and Nonconforming Uses

Are any of the following types of areas, features or nonconforming uses present? If so, where?

Areas with evidence of historic mining at least 50 years old (Do not include areas of significant current mineral activity)· NONE

Areas under current mineral lease that contain a "no surface occupancy" stipulation: NONE KNOWN

Areas under current mineral lease where the lessee has not exercised development and occupancy rights. Outstanding rights have not been exercised on Tract-160, applicable to approximately 1,400 acres

Recreation improvements such as occupancy spots or minor hunting or outfitter camps. Scattered dispersed camp sites are located throughout the area

Timber harvest areas where logging and prior road construction are or are not evident: Logging roads not used for hiking trails are returning to a natural condition

Cultural treatments involving plantations or plantings: None other than the infrequently maintained wildlife openings

Private inholdings in the area: NONE

Dwellings on private inholdings. NOT APPLICABLE

Nonconforming structures and improvements None are known No structures are evident at the old home site at Pine Spring

Ground-return telephone lines: NONE

Watershed treatment areas· There are no known recent activities Note A considerable amount of restoration work was accomplished on the Mills Creek and Coles Runs Impoundments to the south of the area, and Kennedy and Mount Torry Mines immediately *to the north of the area*

Roads: FDR 162B (Green Pond Road) extends 1 5 miles down Kennedy Ridge into the area and is maintained to D-level standards

While not in the interior of the area, FDR 162 presents a dilemma in terms of management of the area's wilderness qualities FDR 162 forms the western boundary of the area and seperates it from the existing St Mary's Wilderness to the west Use along this road is well established and relatively high during certain times of the year Bear hunters use this road extensively Opportunities for motorized trespass into the area exist and would be costly and time consuming to prevent

ORV/ATV Use: The Kelley Mountain area does not currently contain any designated ORV/ATV routes High clearance vehicles are needed to drive down FDR 162, along the area's boundary There have been no locations within the Kelley Mountain area identified *as suitable for the developemnt of ORV/ATV trail systems*

Can existing nonconforming uses be effectively mitigated or terminated through removal or rapid natural deterioration? YES

Are improvements in the area being affected by the forces of nature rather than humans, and are they disappearing or muted? Yes, for the most part

III. EVALUATION

Capability

Does the area contain the basic characteristics that make it suitable for wilderness designation without regard to its availability for or need as wilderness? Consider the following characteristics in analyzing the quality of the wilderness resource. If these characteristics are determined to be important, describe and refer to them

Experiential benefits. Does the area provide the opportunity for solitude and serenity? Relative to most lands in the eastern U S , the area would rate high in wildness, solitude, and difficulty of cross-country travel

Challenge. Does the area offer visitors the opportunity to experience adventure, excitement, challenge, initiative, or self-reliance Is access easy or difficult? Access is rather easy due to the developed road and trail system around the boundary and within the area The rugged terrain offers an opportunity for adventure and challenge

Outdoor Recreation Opportunities What is the area's capability for providing primitive and unconfined types of recreation including

Camping - Suitable locations for primitive camping are available

Hunting - This activity is readily available for small and large game animals

Fishing - Coles Run, Johns Run, Kennedy Creek, and Mills Creek are classed as Wild Trout Streams by the Virginia Department of Game and Inland Fisheries These fisheries sustained heavy damage from the severe floods of 1969 and 1972, however, the damage is not readily evident today Some of the streams may be difficult to fish because of the dense vegetative cover All the streams experience very low flow in the summer months These streams are sampled as part of the Virginia Trout Stream Sensitivity study (VTSSS) and as part of our continuing trout stream study All of these streams are classed as acidic due to their low pH and negative alkalinity or buffering capacity

Mountain Climbing - Opportunities are limited to those that would be suitable to the novice

Ski Touring - This activity is not practical because of the limited quantity of snow and lack of suitable routes

Canoeing - There are no suitable waters for this activity

Boating - There are no suitable waters for this activity

River Rafting - There are no suitable waters for this activity

Backpacking - The area is excellent, especially since the trail system extends into the adjacent Saint Marys Wilderness The Appalachian Trail is located approximately 5 miles to the southeast

Hiking - Same as "i" above. The trails are in acceptable condition and loop hikes are possible Approximately 10 miles of trail are present inside and along the boundary

Riding - There are some areas suitable for riding

Photography - Good opportunities exist.

Special Features.

What is the area's capability to provide outdoor education and scientific study, both formal and informal, in a manner compatible with wilderness? Opportunities exist for studies in geology, biology, and archeology Several species or communities considered sensitive, threatened, endangered, or exemplary examples for protection have been identified in the Saint Mary's Wilderness and Maple Flats Areas There is a high probability that many of these species also exist in the Kelley Mountain area and could be studied

Is there an abundant and varied wildlife population? The presence of game and non-game animals typify an eastern deciduous forest in the Blue Ridge Mountain Range characterized by rather remote, rugged terrain, and a mature forest on soils with low fertility Habitat for bear is excellent, and the area is popular for hunting this species Accurate figures for the various wildlife populations are not available The current featured wildlife management species for the area is bear

A citizens study group has reported that the area contains a good population of timber rattlesnakes, a species that is being depleted throughout its range

Manageability:

What are the characteristics of the surrounding area including ROS classification, adopted VQO, and present and planned uses? ROS on adjacent NF lands are classified as roaded natural (RN), except for semi-primitive, non-motorized (SPNM) on portions in adjoining Saint Mary's Wilderness to the west and a small area across Torry Ridge west of the Sherando Recreation Area The visual quality objective (VQO) varies widely from Preservation to Modification, depending on the the distinctive landscape and aesthetic qualities along travel routes

Timber, recreation, wildlife, fisheries, watershed, wilderness, special, and other resource management functions (in accordance with approved policy, direction, and law) are expected to continue on national forest lands either in or around the Kelley Mountain area Coles Run and Mill Creek Reservoirs, outside the area, are under special use to Augusta County and will continue to serve their domestic water needs

The Maple Flats Area, just outside the area's northern boundary, is proposed for designation as a Special Biological Area by the Virginia Natural Heritage Program

The private Shenandoah Acres Campground, 2 miles to the north, is popular for developed recreation

Do boundary locations conflict with important existing or potential public uses outside the boundary that might result in demands to allow nonconforming structures and/or activities in the wilderness? There are outstanding mineral rights on Tract 160

The location of the western boundary along FDR 162, as discussed earlier, presents a problem from a wilderness management standpoint Hunter and other visitor use of this road is well established Seperating Kelley Mountain from the St Mary's Wilderness, the presence of the road would detract from the wilderness qualities of both areas

Is it possible to readily and accurately describe, establish, and recognize boundaries on the ground? The northern boundary that follows that 2,040 foot contour would be difficult and costly to establish, post, enforce and maintain The contorted shape of the boundary could cause additional problems with management of adjacent lands outside the area Boundary adjustments could be used to mitigate this problem The remainder of the area's boundaries could be readily established on the ground

Do boundaries, where possible, conform with terrain or other features that constitute a barrier to prohibited use? The heavy undergrowth and typically rugged terrain along the trails, roads or general forest that make up the boundaries provide a slight barrier

Do boundaries, to the extent practicable, act as a shield to protect the wilderness environment inside the boundary from the sights and sounds of civilization? The rugged, forested terrain provides some degree of protection from the sights and sounds of civilization, especially in the interior of the area

Do boundaries provide adequate opportunity for access and traveler transfer facilities? YES

Is the area contiguous to existing wilderness, primitive areas, administration-endorsed wilderness, or roadless areas in other Federal ownership? The area is adjacent to the 10,000-acre Saint Mary's wilderness, designated by Congress in 1984

<u>Availability</u>

Describe other (nonwilderness) resource demands and uses:

Recreation - This area provides a variety dispersed recreation opportunities

Information on Wildlife Species, Populations, and Management Needs - Limited amounts of wildlife habitat improvement have *occurred in key areas Because the area has been essentially under custodial management, due primarily to the unproductive/* marginal sites and rugged terrain, species associated with late-successional habitat and undisturbed, aging forest prevail Bear is *currently the featured wildlife species*

Water Availability and Use - Water is usually plentiful for wildlife Water treatment is recommended for safe human consumption

Livestock Operations - NONE

Timber - Because of the very poor sites and steep terrain, the area is considered unsuitable for timber management Approximately 50 acres were proposed for harvest in fiscal years 1991/92, however, recently revised guidelines for riparian area management and other economic requirements will prevent implementation of these sales

Site indicies (SI) vary from the 30 to 50 (50 year base) on the slopes and ridges for upland oaks Some of the drains have a SI of 40 to 50, while the better sites would measure in the 60 to 70 range for upland oak

Based on data in the Continuous Inventory of Stand Conditions (CISC) data base that was used in the existing forest plan, there are approximately 1,882 acres of suitable forest land in the Kelley Mountain area. This amounts to approximately 24 percent of the area's total acreage

Minerals - As previously noted, outstanding rights for iron and manganese exist on Tract N-160 in the northern portion of Kelley Mountain Development and mining of the low grade ore is not economically attractive at this time

Cultural Resources - Most of the Kelley Mountain area consists of terrain that slopes too steeply to have provided prehistoric camping opportunities The flatter portions, in particular the stream valleys and the large expanses of flat terrain in the Big Levels, provided campsites for the prehistoric populations in the area Numerous prehistoric sites have been recorded within this area There are no above-surface structures present

Authorized and Potential Land Uses - There are no existing special uses within the area Volunteer agreements currently allow for road and trail maintenance activites

Management Considerations Including Fire, Insects and Diseases, and Presence of Non-Federal Lands - Because of the protection from fire while under National Forest management, there is a considerable buildup of fuels Man-caused fires are not common within the area Because of the buildup of undergrowth in most of the area, fire suppression could be difficult given wilderness restrictions

Some mortality from the Southern Pine Beetle is evident within the southern pine component Defoliation and mortality within the hardwoods associated with the gypsy moth is almost certain to occur within the next few years Egg mass surveys indicate that numbers are increasing

There are no private in-holdings

What outputs are currently produced or could be produced in the future? Moderate levels of dispersed recreation activities, primarily hunting and hiking, should continue Water from the area will continue to serve domestic needs in the Augusta County Timber harvest is presently impractical, considering the large acreage of unproductive sites

Is the area located such that the need for increased water production and/or additional on site storage is so vital that installation or maintenance of improvements is an obvious and inevitable public necessity? No The area does contain the watersheds that serve both the Coles Run and Mills Creek reservoirs

Would wilderness designation seriously restrict or prevent the application of wildlife management measures of considerable magnitude and importance? The area now contains some bear oak and bear oak/pitch pine/table mountain pine, likely habitats for rare invertebrates, and probably the best habitat for the rare northern pine snakes If wilderness designation precludes the use of prescribed fire, areas now occupied by these fire dependent species could disappear over time Wildfire could compensate for the lack of prescribed fire if allowed to burn under controlled conditions The presence or absence in Kelley Mountain of rare species that depend upon these habitat types has not been confirmed Bear oak and bear oak/yellow pine areas exist on other parts of the forest

Is it a highly mineralized area of such strategic or economic importance and extent that restrictions or controls due to wilderness designation would not be in the public interest? NO

Does the area contain natural phenomena of such unique or outstanding nature that general public access and special development to facilitate public enjoyment should be available? NO

Is the land needed to meet clearly documented resource demands such as for timber, mineral production, or developed recreation? NO

Is the land committed through contractual agreements for use, purposes, or activities not in concert with wilderness requirements? NO

Need

Other Wildernesses:

How far is it to the closest existing wilderness? The 10,000 acre Saint Mary's Wilderness is located immediately to the west of the proposed area

What level of use currently exists in near-by existing wilderness? What trends exist in the use of these areas? According to Recreation Information Management (RIM) use records from 1989, 6,000 recreation visitor days of use were recorded in the Saint Marys Wilderness *Trends indicate a steady increase in use Impacts from this use are starting to show up along Saint Marys river and* the GWNF has instituted a ban on campfires in the area along the lower portion of the river

Is the population in and around these areas increasing or decreasing? How quickly is it increasing or decreasing? The Kelley Mountain area is located in eastern Augusta county Between 1980 and 1990, Augusta's population increased from 53,732 to 56,315 persons at an average annual rate of 0.5 percent. Directly to the east, the population of Nelson county increased from 12,204 to 12,550 during the same period of time Directly to the north and east, the population in Arbemarle county increased between 1980 and 1990 *at an average annual rate of 1.3 percent from 55,783 to 63,544 persons. To the south, the population in Rockbridge county increased* from 17,911 to 18,205 at an annual rate of 0 2 percent over the same period of time

Within the state of Virginia, the population increased at an annual rate of 1 4 percent

Nonwilderness Lands:

Are there opportunities for unconfined and primitive recreation experiences on nonwilderness areas in the vicinity? If so, where? Numerous acres of National Forest land within a reasonable distance of Kelley Mountain are suitable and available for primitive recreation

Habitat.

Are there any biotic species in the area that are directly competing with increasing public use and development? The Virginia *Division of Natural Heritage has identified several species within their proposed Special Interest Area (SIA) called Big Levels Much* of the Kelley Mountain roadless area lies within this porposed SIA Listed below are the species of special concern identified in the Big Levels area by the Heritage Program While these species reside in the Big Levels area, they may or may not reside within the Kelley Mountain roadless area

Scientific Name	*Common Name*
Helonias bullata	swamp pink
Carex polymorpha	variable sedge
Vaccinium macrocarpon	large cranberry

Swamp Pink is ranked as imperiled in Virgina as well as globally (within its range) It is also listed as endangered in Virginia as well as federally threatened Variable sedge is ranked as critically imperiled in Virginia and imperiled globally It has been proposed for federal listing and is listed as endangered in Virginia Large cranberry is ranked as rare in Virginia and apparently secure globally

The Heritage Program discusses several threats and management considerations in their January 11, 1990 report on the area They state that swamp pink "would be threatened by impoundment construction, and road construction activities that would alter patterns of groundwater seepage Logging in close to swamp pink populations (i e within ca 200 m) should not be permitted The many populations of swamp pink within this area create an outstanding opportunity for autecological research that may lead to successful population enhancement techniques "

"The plateau region of Big Levels supports exemplary pitch pine/scrub oak vegetation, the globally rare variable sedge, and in likelihood, rare invertebrate species Prescribed burning is recommended for maintaining and enhancing this ecological system "

"The creation of new roads and trail and timber harvest within this area should be carefully considered prior to implemntation These activities should not be excluded entirely, but in most cases, impacts from these activities would be contrary to the protection purposes of this Special Interest Area "

Could their needs be provided for through means other than wilderness designation? Yes, if applicable

Is there a need to provide a sanctuary for biotic species that cannot survive in less than primitive surroundings? This is unknown at the present time Lack of prescribed fire in the area may result in the elimination of some rare species Studies and data collection are being completed by various scientific and interested groups/individuals

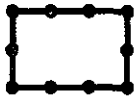
George Washington National Forest
Warm Springs Ranger District

LAUREL FORK ROADLESS AREA

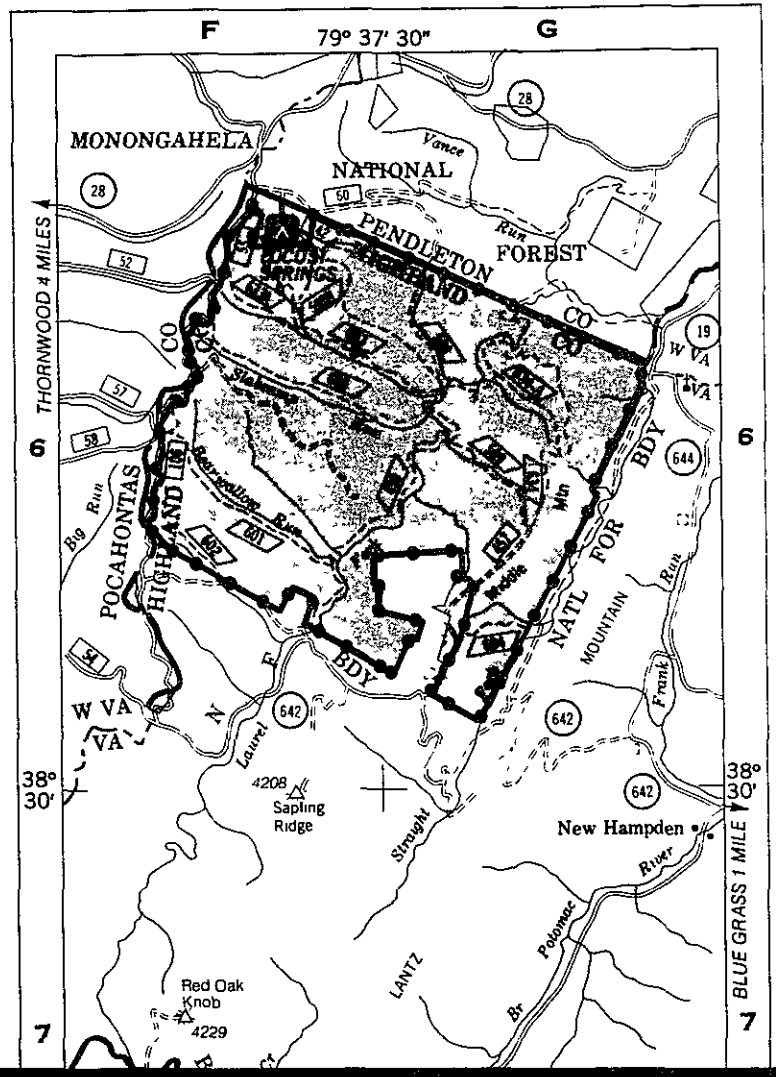
Scale

1:126,720

1/2 inch = 1 mile



Roadless Area



LAUREL FORK ROADLESS AREA

I. DESCRIPTION

Acres: approximately 9,938

Location and vicinity. The Laurel Fork Area is located in northwest Highland County, Virginia on the Warm Springs Ranger District, George Washington National Forest It takes its name from the main stream, a branch of the Potomac River, which bisects it The area is bordered on the west by the Greenbrier Ranger District and on the north by the Potomac Ranger District of the Monongahela National Forest in West Virginia

Describe access to the area including roads and trails leading to the area Monongahela Forest Development Road (FDR) 106 borders the area on the west side, except in one location where the road crosses into West Virginia At this location, the West Virginia/Virginia state line becomes the boundary FDR 106 joins FDR 60, which joins West Virginia State Highway 28 a short distance from the area's NW boundary George Washington NF FDR 457 accesses the SE portion of the area on Middle Mountain FDR 457 joins Virginia Secondary Road 642 a short distance south of the area

General description of the area's geography Laurel Fork Area is located at 38 degrees latitude and 79 degrees longitude It is in a rural forested area in the Alleghany Mountains west of Virginia's Shenandoah Valley The area is unique in the state of Virginia resulting, in part, from the area's location on a high, stream-dissected plateau of Alleghany Mountain The elevations, ranging from 2,700 feet to over 4,000 feet, have given rise to a forest of northern hardwoods and montane red spruce, quite unlike the Appalachian oak forest that dominates the rest of the George Washington National Forest

General description of the area's topography The area is in the Ridge and Valley section of Virginia within the headwaters of the South Fork of the Potomac River Laurel Fork and Straight Fork are the main creeks in the area Elevations range from approximately 4,040 feet on the ridge south of Slabcamp Run to approximately 2,640 feet at the state line in Laurel Fork Creek and 2,560 feet near Staight Fork Creek at the State line at Hardscrabble

West of Middle Mountain, a ridge that runs north/south, the terrain has the more gentle slopes characteristic of the terrain on the headwaters of Greerbriar River in West Virginia East of Middle Mountain, the terrain is steeper and is typical of Highland County, Virginia

General description of the area's vegetation, including the ecosystem type The area lies in the temperate, eastern deciduous forest zone of North America In the 1920's, red spruce was the dominate tree species in the area Railroad logging and at least one intense forest fire changed the ground conditions so that the spruce stands were largely replaced by aggressive northern hardwood species, such as sweet birch, yellow birch, black cherry and sugar maple

Remnants of the original spruce stand remain in isolated clumps The Civilian Conservation Corps planted some spruce and other species on Locust Springs Run drainage, one large red pine plantation is present Some red spruce natural regeneration is returning under the northern hardwood overstory A large deer herd and high beaver population are keeping most natural regeneration or succession of tree species from establishing much of an understory A prominent browse line is evident in the hardwood stands

Key attractions, if any, including sensitive wildlife and scenic landmarks Beaver ponds and meadows in the headwaters of the various runs west of Laurel Fork creek attract many visitors The northern hardwood and spruce forest in the Laurel Fork area is rarely found elsewhere in the state of Virginia If viewed from a regional perspective it is the eastern edge of a forest type covering thousands of acres on the adjoining Monongahela NF There are at least 25 species of flora and fauna that are ranked by the Virginia Division of Natural Heritage as rare in the state of Virginia including the northern flying squirrel, listed as federally endangered, and the water shrew, snowshoe hare and fisher listed as endangered in Virginia Laurel Fork and its tributaries support a brook and rainbow trout fishery Deer, turkey and grouse hunting attract many users

II INVENTORY

Human Influence

To what degree have humans and past and present human activity affected natural ecological processes and conditions? Man's activities have reduced the climax spruce forest to isolated remnants It has been largely replaced by northern hardwood species Overgrown railroad trams are located over the entire area The cuts and fills of these narrow gauge railroad beds will be visually evident for many years to come

To what degree is the area natural or natural appearing and free from disturbance? The second growth forest that covers the area is natural appearing Limited salvage cutting west of Laurel Fork is insignificant No evidence of past impoundments on any of the runs is now evident As noted above, the railroad trams are noticeable

If the area's ecological processes and/or natural appearance have been altered by past or present human activity, is the land regaining a natural, untrammeled appearance? YES

Does the existing or attainable National Forest System ownership pattern, both surface and subsurface, ensure perpetuation of identified wilderness value? See section B 1 - Minerals

Is more than 15 percent of the area in non-native vegetation? No The red pine and eastern larch cover only a small area

Improvements, Structures, and Nonconforming Uses

Are any of the following types of areas, features or nonconforming uses present? If so, where?

Areas with evidence of historic mining at least 50 years old (Do not include areas of significant current mineral activity) NO

Areas under current mineral lease that contain a "no surface occupancy" stipulation The Thornwood-Horton Gas Field in West Virginia/Virginia has known gas potential Gas reserves were discovered at a depth of roughly 5,200 feet within a faulted anticlinal structure in the Dovonian-aged Oriskany Sandstone Drilling on neighboring Monongahela National Forest in West Virginia began in 1961 and ceased in 1964, five gas wells were drilled in this structure Currently, these gas wells located in this remote field are shut-in, awaiting a natural gas pipeline The Thornwood-Horton gas field has the potential for both natural gas production and later, as a *natural gas storage area for the low demand summer months Most of this field, as presently defined, lies on the West Virginia side* of the state line but part of the field is within the Laurel Fork area of the Warm Springs Ranger District Additional drilling could expand the area within the known gas field to other parts of Virginia

Issued leases cover 94 percent, approximately 9,768 acres, of the Laurel Fork area Depending on their respective issuance dates, these leases are set to expire in between 1996 and 1998, unless production is established Federal oil and gas lease BLM-A-0022918, containing 2,168 acres in the western portion of Laurel Fork, is within the known structure of the field and is being held under a communitization agreement (CA) with the Bureau of Land Management This communitization agreement supercedes the original lease and determines the rules for the production of natural gas The CA does not have an expiration date Annual rentals are still collected on the CA while production is inactive

Areas under current mineral lease where the lessee has not exercised development and occupancy rights. *See statement* above

Recreation improvements such as occupancy spots, minor hunting or outfitter camps Numerous occupancy spots are located off FDR 106 and FDR 456

Timber harvest areas where logging and prior road construction are or are not evident Two regeneration areas, 28 acres and 56 acres, were harvested in Buck Run after a windstorm in 1976 On the Straight Fork side, 69 acres were clearcut in 1971 These areas have regenerated to northern hardwoods and the logging roads and trails are revegetated but remain visually evident

Cultural treatments involving plantations or plantings The CCC plantations are large enough to appear natural from a distance *Row planting is still evident on close inspection*

Private inholdings in the area No inholdings exist However, the area surrounds a peninsula of private land called "The Stamp" near the southeast corner Private land along the south boundary and SR 642 contains numerous hunt camps and several yearlong residences

Dwellings on private inholdings Three dwellings in "The Stamp" area are used for hunt camps and sheep camps

Nonconforming structures and improvements NONE

Ground-return telephone lines NONE

Watershed treatment areas NONE

Roads Road access on Middle Mountain, FDR 457, is the only vehicle access into the private landholdings in "The Stamp" area

ORV/ATV use Illegal ORV and ATV use in the Laurel Fork area is not a serious problem There are currently no designated ORV/ATV routes in the area The area east of Middle Mountain could provide suitable ORV/ATV opportunities Development of these opportunities is highly unlikely in light of current management direction and management recommendations of the Virginia Heritage Program which are discussed later in this report

Can existing nonconforming uses be effectively mitigated or terminated through removal or rapid natural deterioration? A minor boundary adjustment would remove FDR 457 from within the area

Are improvements in the area being affected by the forces of nature rather than humans, and are they disappearing or muted? The old trams are being affected both by nature and man, those that are being maintained as trails will remain visible, the remainder are disappearing

III EVALUATION

Capability

Does the area contain the basic characteristics that make it suitable for wilderness designation without regard to its availability for or need as wilderness? Consider the following characteristics in analyzing the quality of the wilderness resource. If these characteristics are determined to be important, describe and refer to them

Experiential benefits. Does the area provide the opportunity for solitude and serenity? Yes, the area is located relatively far from population centers and, as such, offers some excellent opportunities for solitude and serenity, especially in the interior of the area

Challenge Does the area offer visitors the opportunity to experience adventure, excitement, challenge, initiative, or self-reliance Is access easy or difficult? Because the terrain in most of the area is less rugged and steep than most of the GWNF, the challenges associated with cross-country travel is relatively reduced

Outdoor Recreation Opportunities. What is the area's capability for providing primitive and unconfined types of recreation including

Camping - Good

Hunting - Excellent

Fishing - Good on Laurel Fork - Fair to Poor on smaller streams The streams located in Laurel Fork are all classified as extremely sensitive to acidic deposition

Mountain Climbing - Limited opportunities for mountain climbing

Ski Touring - There is some potential for cross-country skiing in the area With the high elevations in the area, snowfall is more consistent and stays on the ground longer

Canoeing - There are no streams or rivers large enough to support this activity

Boating - There are no streams or rivers large enough to support this activity

River Rafting - There are no streams or rivers large enough to support this activity

Backpacking - The existing trail system provides good access into the area and offers excellent opportunities for backpacking

Hiking - Excellent opportunities exist on the trail system

Riding - Good on existing trail system

Photography - Beaver ponds and spruce meadows offer excellent opportunities Few vistas are available

Special Features:

What is the area's capability to provide outdoor education and scientific study, both formal and informal, in a manner compatible with wilderness? UNKNOWN

Is there an abundant and varied wildlife population? YES

Manageability:

What are the characteristics of the surrounding area including ROS classification, adopted VQO, and present and planned uses? The east and south sides of the Laurel Fork area are adjoined by privately owned lands Uses such as hunt camps and recreation second homes are increasing The west and north sides of the area join the Monongahela NF. The inventoried ROS classes are SPNM, SPM and RN Inventoried VQO classes are R, PR, and M

Do boundary locations conflict with important existing or potential public uses outside the boundary that might result in demands to allow nonconforming structures and/or activities in the wilderness? Future downstream potable water needs may create demand for water storage structures The adjacent private lands make access by motorized vehicles relatively easy Demand for motorized access is increasing

Is it possible to readily and accurately describe, establish, and recognize boundaries on the ground? Except for the west boundary along FDR 106 and the divide along the state line, all other boundaries are artifical land lines established by man as property boundaries The state line between Pendleton County and Highland County exists only on maps

Do boundaries, where possible, conform with terrain or other features that constitute a barrier to prohibited use? NO

Do boundaries, to the extent practicable, act as a shield to protect the wilderness environment inside the boundary from the sights and sounds of civilization? NO

Do boundaries provide adequate opportunity for access and traveler transfer facilities? YES

Availability

Describe other (nonwilderness) resource demands and uses.

Recreation - Vehicle camping at occupancy spots along the access routes is common during the hunting seasons Illegal ATV and snowmobile use occurs from time to time

Information on Wildlife Species, Populations, and Management Needs - A noticeable browse line indicates that the area's deer population is high Snowshoe hare habitat, a critical component being brushy cover, is declining and populations are almost extirpated. The northern flying squirrel has been found in the area As noted earlier, at least 25 species of fauna have been identified as rare in the state of Virginia

Water Availability and Use - There are numerous streams in the area. The water quality is high in the area

Livestock Operations - Sheep and cattle graze on the private lands to the south and east and occasionally stray into the area

Timber - Currently, no timber harvesting is occurring in the area Based on data in the Continuous Inventory of Stand Condition (CISC) data base that was used in the existing forest plan, there are approximately 9,800 acres of suitable forest land in the Laurel Fork area This amounts to approximtely 95 percent of the area's total acreage

Minerals - Gas & Oil leases - no current surface activity

Cultural Resources - The Laurel Fork area offers interesting contrasts in its potential to have been occupied by prehistoric populations. Much of the area is steeply sloping and has virtually no potential to contain sites The remaining more gently sloping

areas do have potential for prehistoric sites, in fact, four prehistoric campsites have been discovered There is potential for an increased number of sites to be discovered

No lithic resources within the immediate vicinity of the Laurel Fork area that would have been utilized by prehistoric populations have been found to date There are, however, limestone formations in the Greenbriar Valley of West Virginia that contain cherts that would have been used The importance of the lack of lithic resources is that all lithics would have been carried into the area, and any lithic debitage found would have probably resulted from tool curation and not manufacture By its nature, debitage resulting from tool curation is quite small and more difficult to see One could conclude, therefore, that within the Laurel Fork area, prehistoric occupation may have been greater than what appears to be present

Historic use of the area may include house sites, small farmsteads, and logging activities, although no house sites have been recorded as yet The area around Locust Springs Shelter appears to have been a possible house site Sites associated with logging activities include the narrow gauge railway locations mentioned previously in the description of the area and logging camps No logging camps have been discovered, but they probably were located there, perhaps along Slab Camp Run Portable saw mill sites may also exist

Authorized and Potential Land Uses - NONE

Management Considerations including Fire, Insects and Diseases, and Presence of Non-Federal Lands - The Gypsy Moth is invading the area now Defoliation is expected in two to three years

What outputs are currently produced or could be produced in the future? Ninety-seven percent of the 10,312 acres is classified as suitable for timber production The area may contain a natural gas deposit suitable for commmercial development

Is the area located such that the need for increased water production and/or additional onsite storage is so vital that installation or maintenance of improvements is an obvious and inevitable public necessity? Not at the present time

Would wilderness designation seriously restrict or prevent the application of wildlife management measures of considerable magnitude and importance?

Wilderness designation may limit or preclude habitat manipulation for the snowshoe hare It is thought that without habitat manipulation, primarily aimed at creating areas with dense understory growth, the snowshoe hare could become extirpated from the state of Virginia

The needs of the northern flying squirrel are best addressed in a Recovery Plan for the species

Is it a highly mineralized area of such strategic or economic importance and extent that restrictions or controls due to wilderness designation would not be in the public interest? The extent of the natural gas field is not known at the present time

Does the area contain natural phenomena of such unique or outstanding nature that general public access and special development to facilitate public enjoyment should be available? NO

Is the land needed to meet clearly documented resource demands such as for timber, mineral production, or developed recreation? NO

Is the land committed through contractual agreements for use, purposes, or activities not in concert with wilderness requirements? See Minerals section above

Need

Other Wilderness·

How far is it to the closest existing wilderness? Laurel Fork South is 8 miles to the northwest

What level of use currently exists in near-by existing wilderness? What trends exist in the use of these areas? Use in the Rough Mountain wilderness, also located on the Warm Springs District, totalled 300 recreation visitor days in 1989 This amount of use is very low relative to that occurring in the Ramseys Draft and Saint Marys wildernesses, also on the George Washington This low level of use in Rough Mountain can be explained in part by the poor access and limited trail system in the Rough Mountain area

Is the population in and around these areas increasing or decreasing? How quickly is it increasing or decreasing? Between 1980 and 1990, the population in Highland County declined from 2,937 to 2,436 people Directly to the east in Pocahontas County,

West Virginia, the population decreased from 9,919 to 9,141 people over the same period of time To the north, the population in Pendleton County, West Virginia increased modestly from 7,910 to 7,997 people

Nonwilderness Lands:

Are there opportunities for unconfined and primitive recreation experiences on nonwilderness areas in the vicinity? If so, where? Yes, opportunities for primitve and unconfined recreation exist on adjacent National Forest land in West Virginia.

Habitat:

Are there any biotic species in the area that are directly competing with increasing public use and development? The Laurel Fork area has been studied by the Virginia Heritage Program. As a result of its studies, the Heritage Program has ranked 18 species of flora and fauna as being critically imperiled in the state of Virginia It has ranked four species as being imperiled and one other species as rare or uncommon in Virginia All but one of these species is ranked as being demonstrably secure globally A complete listing of these species is available in the Supervisor's Office of the George Washington National Forest located in Harrisonburg, Virginia.

Laurel Fork contains the northern flying squirrel which is listed endangered by both the federal and Virginia state governments The water shrew has been proposed for federal listing but a determination has not been made at this time The water shrew, snowshoe hare and fisher are listed in the state of Virginia as endangered

According to the Heritage Program report, "current threats to the natural heritage resources occurring in the Laurel Fork area are overuse for recreation, off-road vehicle use, natural and artificial red spruce conversion to hardwoods, a general reduction of average timber age, and single or nonsensitive species management prescriptions Management for natural red spruce regeneration is recommended as well as management for maintenance of natural beaver activity within the watersheds .Ongoing and new management prescriptions should simulate natural ecological processes through the use of tools such as prescribed fire "

In its recommendations for protection, the Heritage Program states that "The proposed Laurel Fork SIA should be managed as a Special Interest Area with a core area composed of the Slabcamp and Bearwallow Run watersheds forming a Research Natural Area "

Active habitat management might be more difficult or precluded under a wilderness designation This would depend upon the management practice and/or the species in question

Could these needs be provided for through means other than wilderness designation? *Yes, a variety of other management* designations could be used to provide for the needs of the species of special concern in the Laurel Fork area

Is there a need to provide a sanctuary for biotic species that cannot survive in less than primitive surroundings? No such need is known

George Washington National Forest
Warm Springs Ranger District

LITTLE ALLEGHANY ROADLESS AREA

Scale

1:126,720

1/2 inch = 1 mile

N

Roadless Area

LITTLE ALLEGHANY ROADLESS AREA

I. DESCRIPTION

Acres. approximately 10,109

Location and vicinity. This area is located on the Warm Springs Ranger District of the George Washington National Forest It lies in western Bath County Virginia north of the community of Mountain Grove and south of the Bath County Pumped Storage Station operated by Virginia Power

The western boundary follows private land in the Little Back Creek valley, leaving the valley private land to climb toward Chestnut Levels and the Virginia/West Virginia state line The northern boundary parallels the state line and private land at Mad Sheep Ridge (elevation 4,225 feet) There it turns southward following ridges across Little Alleghany Mountain until private land is again encountered near Springhouse Run The eastern side follows private land along Back Creek The southern edge follows private land north of State Highway 39 from Mountain Grove to the Routes 39/600 intersection

The area basically encompasses the east and west sideslopes of Little Alleghany Mountain and its accompanying drainages *Drainages in the area are Jim Dave Run, Ryder Run, Sapling Woods Hollow, Gill Gum Hollow, Davis Hollow, Alex Run, Schoolhouse* Run, and Springhouse Run

Describe access to the area including roads and trails leading to the area. Virginia Routes 39, 600 and 60, and Forest Road 55 are perimeter roads that provide access to the area Forest Road 55 is open yearlong Virginia Route 601 provides access north of Big Lick Run and between Big Run and Wildcat Hollow west of Little Back Creek. This road does not provide access to the Little Alleghany Mountain portion of the area

Public access is limited to three locations along the perimeter of the area since most of the areas is surrounded by private land. First, a short stretch of public land lies along Virginia Route 39 about 1/2 mile south of the intersection of Virginia routes 601 and 39 Secondly, Forest Road 55 provides public access between Chestnut Levels and Mad Tom Thirdly, the VEPCO road up Joe Hollow provides access to the northeast section of the area

Highway 39 touches the foot of Little Alleghany Mountain near Sapling Woods Hollow Joe Hollow Road (Va Power Road) off Virginia Route 600 provides the only public access to the northeast side of the area. This road is open to the public but no overnight camping *is allowed along it*

There are no Forest Service trails that provide access to the interior of the area

Three known 4-wheel drive trails originating on private land penetrate Little Alleghany Mountain. One 4-wheel drive trail goes up Jim Dave Run for approximately 2 0 miles Another leaves private property (McLaughlin) that pinches into the east side of the study area south of Schoolhouse Run It traverses the top of Little Mountain and follows its ridge top both south and north for about 2 5 miles in total The third 4-wheel drive road leaves Little Back Creek near the end of private land and goes about 0.5 miles part way up the mountain None of these routes are listed as components of the Forest's transportation system

General description of the area's geography Little Alleghany Mountain is in the Ridge and Valley section of Virginia, west of the Shenandoah Valley The area is in the Little and Big Back Creeks drainage both of which are tributaries of the James River The northern part lies on the eastern slope of Big Alleghany Mountain

Soils are of two formations on Little Alleghany Mountain Higher elevations contain Reddish Knob-Lehew, while Berks-Rushtown-Weikert occur elsewhere. The Lehew soils are not very common to this area Soil depth is shallow except along main stream channels and in the larger coves These soils are either of shale or sandstone origin

On Little Alleghany Mountain many slopes contain nothing but rock rubble and ledges with bands of solid rock walls running parallel *to the slope. On Little Mountain, shaley surface rock is common but rock and ledge barriers are not common*

General description of the area's topography. Elevations range from 4,200 feet on Mad Sheep Ridge on Big Alleghany Mountain, 3,440 feet on top of Little Alleghany Mountain to 1,860 feet at Sapling Woods Hollow along Highway 39 Slopes are generally steep, averaging 55 to 65 percent with steeper pitches not uncommon

General description of the area's vegetation, including the ecosystem type An Eastern decidious forest covers the entire area Upland hardwoods, mainly oaks, occupy the sites Pitch, Table Mountain & Virginia pines show up on the drier sites Eastern Hemlock,

Basswood, Cucumber Tree and Sugar Maple are mixed with the oaks on the moister sites Eastern white pine can be found on some sites No red spruce is found in the area even though the elevation is high enough on Big Alleghany Mountain Understories are open with occasional dense thickets Typical understories present in the area consist of grape, dogwood, serviceberry and laurel thickets, although they are sparse Red and striped maple exist occasionally

No meadows or other openings exist in the area

The riparian zone along Jim Dave Run has clumps of beech, birch and hemlock

Many trees received heavy ice damage during the Easter ice storm of 1978

Key attractions, if any, including sensitive wildlife and scenic landmarks. The water shrew (Sorex palustris) was found outside the area in a high rocky hollow near the upper reservoir of the Bath County Pumped Storage Power Station No scenic landmarks are known to exist in the area

In general, the area is steep, rugged and relatively isolated

II. INVENTORY

Human Influence

To what degree have humans and past and present human activity affected natural ecological processes and conditions? The area has been cut over within the past 75 years Most of the area is covered with second growth timber On Big Alleghany Mountain between Chestnut Levels and Mad Sheep Ridge, there are 8 clearcut units totaling 325 acres These regeneration cuts were made in 1973 and 1983 These units are high on the mountain and were logged with temporary roads These areas have regenerated to hardwoods and the logging roads have been closed and revegetated. Some faint remnants of old skid trails and logging roads can be noted in the area but would not be evident to the casual observer The forest between Alex Run and Jim Dave Run was harvested before the Forest Service acquired the land from the Tidewater Hardwood Corporation in 1936 This area was also selectively logged in the early 1950s

With the exception of tall fescue found on the logging roads, the entire area is in native vegetation

Outstanding minerals rights on 380 acres on Little Alleghany Mountain is all that is noted for the entire area Most of the area is covered with gas & oil leases

BARC Electric Cooperative maintains a power line just north of Virginia Route 39 within the area

To what degree is the area natural or natural appearing and free from disturbance? With the exception of the timber harvesting noted above and two small antenna sites, the area has a natural appearance

If the area's ecological processes and/or natural appearance have been altered by past or present human activity, is the land regaining a natural, untrammeled appearance? YES

Does the existing or attainable National Forest System ownership pattern, both surface and subsurface, ensure perpetuation of identified wilderness value? Outstanding mineral rights exist on 380 acres on the west slope of Little Alleghany Mountain north of Alex Run Over 80 percent of the area borders private land It is doubtful that much of the adjoining private land would be available for acquisition to add to or buffer the area to ensure perpetuation of identified wilderness values within the area Typically, adjacent landowners cut some firewood within the area adjacent to their land Most of the area is leased for oil and gas Lease numbers are ES 18739, 18740, 18741, 18742, 18743, 18518 and 24732

Is more that 15 percent of the area in non-native vegetation? NO

Improvements, Structures, and Nonconforming Uses

Are any of the following types of areas, features or nonconforming uses present? If so, where?

Areas with evidence of historic mining at least 50 years old NONE

Areas under current mineral lease that contain a "no surface occupancy" stipulation· Current leases exist but it is unknown at this time whether this stipulation is contained in the lease

Areas under current mineral lease where the lessee has not exercised development and occupancy rights: No activity has yet taken place on the area leased for oil and gas exploration No activity has yet taken place on the 380 acres of outstanding mineral rights

Recreation improvements such as occupancy spots or minor hunting or outfitter camps: Several dispersed camping sites, used mainly by hunters, exist along Forest Road 55 on Big Alleghany Mountain

Timber harvest areas where logging and prior road construction are or are not evident: See section II A 1 above

Cultural treatments involving plantations or plantings: NONE

Private inholdings in the area: NONE

Dwellings on private inholdings: NONE

Nonconforming structures and improvements: Two small TV antenna sites exist within the area A powerline crosses a short segment just north of Virginia Route 39

Ground-return telephone lines: NONE

Watershed treatment areas: NONE

Roads: See I.C above No Forest Service roads enter the area

ORV/ATV Use: ATV and ORV use within the area is well established, especially along those routes described earlier

Can existing nonconforming uses be effectively mitigated or terminated through removal or rapid natural deterioration? Yes, the special use permits associated with the two TV antenna sites can be revoked Little opportunity exists to reroute the power line However, the powerline could be excluded from the area by adjusting the southern boundary where it occurs for approximately 1,000 feet

Elimination of existing ORV/ATV use in the area would be very difficult. It would require costly and time consuming law enforcements efforts

Are improvements in the area being affected by the forces of nature rather than humans, and are they disappearing or muted? *Existing 4-wheel drive trails, powerline and antenna sites noted are still being maintained The timber sale areas are being muted and* will disappear over time

III EVALUATION

Capability

Does the area contain the basic characteristics that make it suitable for wilderness designation without regard to its availability for or need as wilderness? Consider the following characteristics in analyzing the quality of the wilderness resource. If these characteristics are determined to be important, describe and refer to them.

Experiential benefits. Does the area provide the opportunity for solitude and serenity? Due to its relatively large size, steep slopes and very limited public access, the area offers good opportunities for solitude and serenity However, the sights and sounds of human activity will be noticeable due to the rather narrow shape of the area between Virginia Routes 600 and 601 The developed private lands on Little Back Creek and Big Back Creek eliminate depth in an east/west direction except on Jim Dave Run and upper Little Back Creek

Challenge Does the area offer visitors the opportunity to experience adventure, excitement, challenge, initiative, or self-reliance Is access easy or difficult? Rock outcrops and ledges on Big Alleghany Mountain and steep terrain elsewhere allow visitors to experience the challenge and self-reliance of hiking cross-country Access is easy along FDR 55 on the West Virginia State Line but very poor to nonexistent over much of the remainder of the area

Outdoor Recreation Opportunities. What is the area's capability for providing primitive and unconfined types of recreation including

Camping - Primitive camping opportunities would be fair due to lack of available water on the ridges where most of the camping would occur

Hunting - Hunting is limited by the lack of public access Private landowners adjacent to the area typically lease their land to hunters This provides hunters the opportunity to gain access to the nearby public land

Fishing - Native trout fisheries exist on Little Back Creek Native brook trout have been found in Long Spring Run on the east side of Big Alleghany Mountain Jim Dave Run on Little Alleghany Mountain contains brook trout also

Mountain Climbing - Rock ledges exist on the east slope of Big Alleghany Mountain between Chestnut Levels and Map Sheep Ridge that could be suitable for short stretches of mountain climbing

Ski Touring - NONE

Canoeing - NONE

Boating - NONE

River Rafting - NONE

Backpacking - No Forest Service trails exist in the area Cross-country backpacking is available everywhere, but typically would occur along the north-south ridge of Little Alleghany Mountain Trips lasting several days are possible

Hiking - Since no Forest Service trails exist, limited opportunities for single-day hiking trips exist However, combined with backpacking, hiking trips lasting several days are possible

Riding - Since no Forest Service trails exist, current opportunities are poor Future opportunities exist to build trails for both hiking and horseback riding. However, due to steep slopes, rock rubble and shaley surface rock, opportunities may be limited

Photography - Since the entire area is covered with deciduous forest, limited opportunities exist that afford views of the valleys and mountains beyond. Stream bottoms may provide some limited opportunities for nature photography One stream that might provide good photographic opportunities is Jim Dave Run with its clumps of beach, birch and hemlock

Special Features:

What is the area's capability to provide outdoor education and scientific study, both formal and informal, in a manner compatible with wilderness? While studies and education on undisturbed eastern forest could be done, most of the area cannot be reached in a day due to limited access This severely limits educational opportunities in the area

Is there an abundant and varied wildlife population? The area supports mainly deer, turkey, squirrels, and other wildlife typical of the Mid-Appalachian Region A complete inventory of the area's flora and fauna has not been compelted

Manageability:

What are the characteristics of the surrounding area including ROS classification, adopted VQO, and present and planned uses? Because of the way the area has been defined, most of the land adjacent to the area is private Forest Service land is classed as Roaded Natural VQO's range from partial retention to modification Most of the adjacent NF land is general forest land suitable for management for timber, wildlife, water, and other resources

Do boundary locations conflict with important existing or potential public uses outside the boundary that might result in demands to allow nonconforming structures and/or activities in the wilderness? Input from Virginia Power Engineer Dan Young indicates expansion plans for the Bath County Pumped Storage Station could call for construction of another storage reservoir and power house The Forest Service Land north of Long Spring Run would be affected

Nonconforming uses originating on lands adjacent to the area would conflict with wilderness management objectives

Is it possible to readily and accurately describe, establish, and recognize boundaries on the ground? YES, established land lines, roads and terrain features make up the boundary

Do boundaries, where possible, conform with terrain or other features that constitute a barrier to prohibited use? NO Boundaries of this area have little value as barriers to prohibited use, since most boundaries are adjacent to private land Landowners typically cut some firewood in the area Three known jeep trails originating on private land penetrate the area

Do boundaries, to the extent practicable, act as a shield to protect the wilderness environment inside the boundary from the sights and sounds of civilization? NO, because the boundary follows roads and private land and since the area has limited interior depth in an east-west direction, the wilderness environment is not protected from the sights and sounds of civilization

Do boundaries provide adequate opportunity for access and traveler transfer facilities? NO there are only three areas where the public has access See section I C

Availability

Describe other (nonwilderness) resource demands and uses.

Recreation - Vehicle Camping along FDR 55

Information on Wildlife Species, Populations, and Management Needs - Little Alleghany Mountain is a very popular hunting area for people with hunt camps and hunting rights on private land up Big and Little Back Creeks Deer and turkey are the most prized species Improved habitat diversity will benefit the existing deer herd Damage to local farm crops and pastures is increasing

Water Availability and Use - Very good water up Little Back Creek Water is used as a municipal water supply at Covington, Va , where it is taken out of the Jackson River below Lake Moomaw

Livestock Operations - NONE

→**Timber -** There are about 9,336 acres classed as suitable for timber management under the existing Forest Plan

Minerals - The mineral potential is not fully known Oil and gas leases cover most of the area No surface activity is occurring

Cultural Resources - NONE KNOWN

Authorized and Potential Land Uses - Mineral rights are outstanding on 380 acres. Two small electronic sites exist

Management Considerations Including Fire, Insects and Diseases, and Presence of Non-Federal Lands. The Gypsy Moth should be causing heavy mortality in about 5 years

What outputs are currently produced or could be produced in the future? No timber is currently being produced on Little Alleghany Mountain due to high roading costs

Is the area located such that the need for increased water production and/or additional onsite storage is so vital that installation or maintenance of improvements is an obvious and inevitable public necessity? NO

Would wilderness designation seriously restrict or prevent the application of wildlife management measures of considerable magnitude and importance? NO

Is it a highly mineralized area of such strategic or economic importance and extent that restrictions or controls due to wilderness designation would not be in the public interest? NO

Does the area contain natural phenomena of such unique or outstanding nature that general public access and special development to facilitate public enjoyment should be available? NO

Is the land needed to meet clearly documented resource demands such as for timber, mineral production, or developed recreation? NO

Is the land committed through contractual agreements for use, purposes, or activities not in concert with wilderness requirements? The oil and gas leases would fall in this category if surface development is started The powerline and two TV antenna sites are under special use permits

Need

Other Wilderness.

How far is it to the closest existing wilderness? Cranberry to the West and Rough Mountain to the East are both about 16 air miles away.

What level of use currently exists in nearby existing wilderness? What trends exist in the use of these areas? Wilderness use is decreasing on the Forest according to yearly estimates

Is the population in and around these areas increasing or decreasing? How quickly is it increasing or decreasing? The area is located in Bath County, Virginia Its population changed from 5,860 in 1980 to 5,026 in 1990 This represents a 1 5 percent annual rate of decrease

Nonwilderness Lands:

Are there opportunities for unconfined and primitive recreation experiences on nonwilderness areas in the vicinity? If so, where? YES - on adjacent National Forest System lands

Habitat:

Are there any biotic species in the area that are directly competing with increasing public use and development? NO

Could these needs be provided for through means other than wilderness designation? NOT APPLICABLE

Is there a need to provide a sanctuary for biotic species that cannot survive in less than primitive surroundings? NONE KNOWN

George Washington National Forest
Dry River Ranger District

LITTLE RIVER ROADLESS AREA

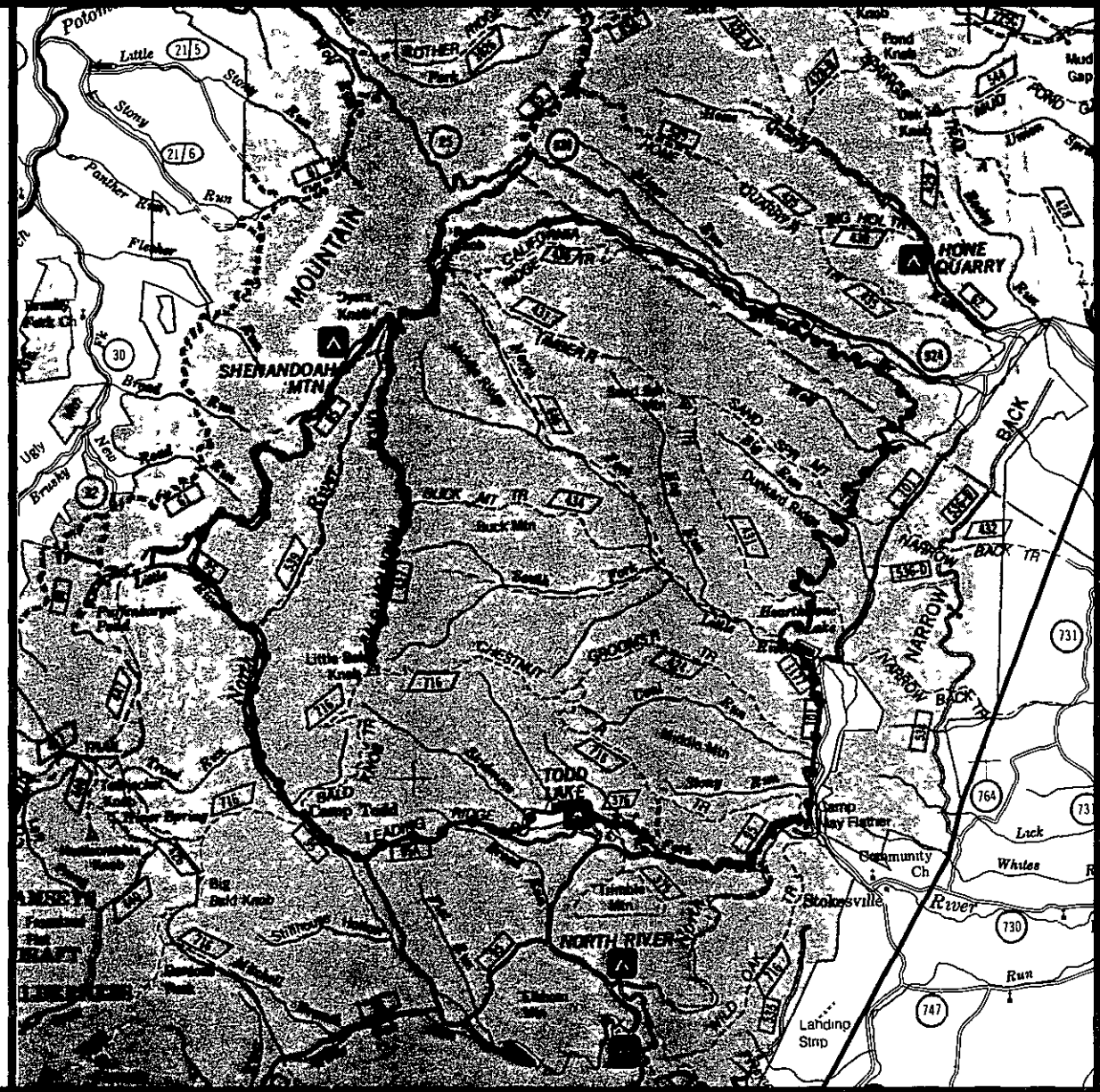
Scale

1:126,720

1/2 inch = 1 mile

N

Roadless Area



LITTLE RIVER ROADLESS AREA

I DESCRIPTION

Acres· approximately 27,248 acres

Location and vicinity: The area is located on the Dry River Ranger District, George Washington National Forest It is located primarily in Augusta County, Virginia with a small portion in Rockingham County, Virginia The western boundary parallels the Virginia/West Virginia state line following forest development road (FDR) 85 on the top of Shenandoah Mountain and FDR 95 in the North River drainage The northern boundary is located along Briery Branch and California Ridge Briery Branch is adjacent to Virginia State Route 924 The eastern boundary follows FDR 101 and 1177 on the south end of the area and then picks up the 2,200 foot contour from Hearthstone Lake north to Briery Branch. The southern boundary follows Forest Roads 95 and 95A, leaving the roads when necessary to avoid a developed recreation area and private land

The Little River area encompasses the Little River watershed above Hearthstone Lake as well as drainages along the upper reaches of the North River, the Skidmore Forks, Stony Run, Coal Run, Big Run, and Wolf Run

Access, including roads and trails leading to the area. Virginia Route 924 and Forest Roads 85, 95, 95A, and 101 are perimeter roads that provide access to the exterior of the area All of the perimeter roads are open for year-round public use but are not treated for snow and ice removal Virginia Route 718 provides access to Forest Roads 95 and 101 Forest Roads 427 and 1773 provide access to interior parts of the area A portion of FDR 427 is open to the public in the fall for hunting season During the remainder of the year it is used for administrative access only Road 1773 is used only for admininstrative access and is not open for public use

The following Forest Service trails provide access to the interior of the area
378, 423, 424, 431, 434, 436, 539, 646, 646A, and 716 Forest trail 716 forms a portion of the Wild Oak Trail, a National Recreation Trail Trails 423 and 431 are also used for motorized administrative access There are a number of additional trails throughout the area that are not listed on the Forest's Transportation Inventory System data base

General description of the area's geography. The area lies within the Ridge and Valley Physiographic Province of Virginia and West Virginia It contains mountain ridges with parallel drainages in a contorted arrangement with spur ridges and associated small drainages leading off the major ridges The major ridge systems are Shenandoah Mountain, California Ridge, Timber Ridge, Wolf Ridge, Sand Spring Mountain, Hearthstone Ridge, Middle Ridge, Buck Mountain, Little Bald Knob, Chestnut Ridge, Big Ridge, and Grindstone Mountain

The principle rock formation in the area is Devonian sandstone of the Hampshire formation This is a hard, often reddish sandstone In the south and east portions of the area, the Hampshire dips beneath the Mississippian sandstone of the Pocono formation The Pocono formation is a light sandstone with some shale and thin beds of low-grade coal Early in this century the coal was mined on a domestic scale in one or two places, notably along Coal Run, whence the name

General description of the area's topography Elevations range from roughly 1,600 feet on the southeastern edge near Little River to 4,400 feet near Reddish Knob on the western side Slopes vary from moderate to very steep and are dissected by numerous small streams

General description of the area's vegetation, including the ecosystem type. An Eastern deciduous forest covers the entire area Oaks, hickories and maples occur on north and east facing slopes and other moist sites The best sites, usually in the deeper, more moist drainages, contain cove hardwoods including black and red oak, birches, ashes, and maples The poorest sites, on ridge tops and southern and western exposures contain oak, yellow pine and white pine in mixture

The area on Timber Ridge contains a typically deep soils that support stands of very large red oaks

Understory vegetation varies with aspect and moisture regime of a site Riparian vegetation exists along perennial and larger intermittent streams The driest sites contain fetterbush, scrub oaks, and yellow and white pine regeneration Intermediate sites contain pine and a lesser amount of hardwood regeneration, understory tree species such as dogwood and black gum, laurel, and sparse amounts of herbaceous plants A report submitted by interested citizens indicates that flora in the area is abundant and varied Some of the wildflower species observed are wood lily, painted trillium, grass of parnassus, yellow-fringed orchid, bear grass (turkey beard), featherbell, fly poison, and trailing arbutus Tree and shrub species they identified include mountain ash, American and beaked hazelnuts, deciduous holly, eastern hemlock, tulip poplar, basswood, cucumber tree, and a variety of yellow pines, oaks, and hickories Large trees are found on the better sites

Key attractions, if any, including sensitive wildlife and scenic landmarks. There are no significant landforms, or other prominent features The land is steep and rugged, particularly near the top of Shenandoah Mountain Wildlife species are black bear, which requires remote habitat, and the Cow Knob Salamander, which is endemic to the higher elevations of Shenandoah Mountain, along with fauna typical of the Appalachian Mountains

Spectacular vistas of the Shenandoah Valley are provided from many of the high ridges and knobs

II. INVENTORY

Human Influence

To what degree have humans and past and present human activity affected natural ecological processes and conditions? Except for the deeper, rugged drainages, most of the area was cut over in the late 1800's and early 1900's Existing forest cover now averages 90 years or older The area burned frequently prior to government acquisition

About 900 acres have been logged in the past 40 years with 400 acres replanted with white pine Just outside the eastern boundary of the area, approximately 180 acres is now being harvested under contract or permit or is planned for harvest in 1991 These harvest cuts border the area along Virginia Route 924 and Forest Road 101

There are an estimated 50 grassy, man-made wildlife clearings and about 15 man-made wildlife waterholes within the area

Little evidence of turn-of-the-century activities exists Recent activities have had little impact on ecological processes and conditions in the area.

Of particular concern in Little River is the high sensitivity of the area's streams to the effects of acid deposition Little River, Big Run, Wolf Run, and the North River are all extremely sensitive to this phenomenon Negative effects associated with acid depostion are already evident in the area and if they continue to occur, it might become necessary to manage these streams and rivers to counteract these effects This is especially true if any sensitive species, including any that are threatened or endangered, are found in these aquatic environments. Given the large number of sensitive species already identified in and around the Little River area, it is highly likely that such aquatic species might exist

To what degree is the area natural or natural appearing and free from disturbance? Except for recent timber harvest areas and wildlife improvements the area appears to be in a natural condition Those places where man's activities are evident comprise a very small percentage of the area

Sounds of man's activities including vehicles traveling boundary roads can be heard in adjacent areas within the boundary

If the area's ecological processes and/or natural appearance have been altered by past or present human activity, is the land regaining a natural, untrammeled appearance? Except for areas recently harvested, the area appears natural to the average visitor

Does the existing or attainable National Forest System ownership pattern, both surface and subsurface, ensure perpetuation of identified wilderness value? There are no apparent surface ownership patterns that would preclude perpetuation of wilderness values Mineral rights in tracts S-3, S-8 and S-17B, portions of which are located within the area, are preserved in perpetuity Approximately 2,640 acres of these tracts are located within the proposed Little River boundary The rights in Tract S-3 are owned by the Chesapeake and Western Railroad, Tract S-8 rights are owned by Samuel B Loose and Tract S-17B are owned by Shenandoah Land and Anthracite Coal Company There is no evidence that valuable subsurface mineral deposits exist Since the U S Government does not own all of the subsurface, the owner could mine if they elected to do so This would adversely impact wilderness values Mineral owners in the area have previously expressed interest in divesting their mineral interests

Indications are that low grade coal deposits may exist in the Coal Run Area The area containing the surface indications of coal deposits is within tract S-3, where mineral rights have been reserved Early in this century, coal was mined on a domestic scale in one or two locations Given the low grade of the coal and the fact that the existing seams are only four to eight inches thick, it is doubtful that this coal could be commercially mined

There is a possibility that the area contains shale and gravel deposits that could be commercially developed

Is more than 15 percent of the area in non-native vegetation? NO

Improvements, Structures, and Nonconforming Uses

Are any of the following types of areas, features or nonconforming uses present? If so, where?

Areas with evidence of historic mining at least 50 years old: NONE

Areas under current mineral lease that contain a "no surface occupancy" stipulation. No current leases exist Mineral rights are reserved on three tracts as described earlier

Areas under current mineral lease where the leasee has not exercised development and occupancy rights: NONE

Recreation improvements such as occupancy spots or minor hunting or outfitter camps: Primitive, dispersed campsites are scattered throughout the area Some trail signs and markers are present within the area

Timber harvest areas where logging and prior road construction are or are not evident: About 800 acres have been logged within the Little River area since the 1950's These harvest areas and associated temporary roads and skid trails are returning to a natural state but remain visually evident

Some of the old access and logging roads built prior to government acquisition still exist These old roads are overgrown, but the roadways are still visually evident.

Cultural treatments involving plantations or plantings: About 400 acres have been planted with white pine since the early 1950's

Private inholdings in the area NONE

Dwellings on private inholdings: NONE

Nonconforming structures and improvements. A power line bisects the northern portion of the area, running west from FDR 101 to the top of Sand Spring Mountain and continuing up Timber Ridge to an electronic site on Reddish Knob Most of this power line follows trails which are used by motorized vehicles to service and maintain the power line

Ground-return telephone lines. NONE

Watershed treatment areas: The core of this roadless area is the Little River Special Management Area The Little River Area, Management Area #6 in the Forest Land and Resource Management Plan contains 10,816 acres Management Area #6 currently is managed to protect its natural values, to provide primitive, nonmotorized recreation opportunities, and to allow for natural stabilization processes to occur A devastating flood in 1949 severely damaged stream channels and denuded many areas of vegetation The area has been used by the U S Geological Survey for the study of post-flood development of mountainous terrain.

Roads: The following Forest Service system roads enter the area

FDR 427 extends southward into the area from the north boundary for 5 miles It is used primarily for administrative access although the first 2 miles are seasonally open for hunting access The current boundary proposal excludes this road by defining a narrow corridor that surrounds the road and extends into the heart of the area

FDR 1773-- 1 mile used for administrative access The first one-half mile is open to the public

ORV/ATV Use: ORV and ATV use is very popular in and around the Little River area As discussed above, FDR 427 is used seasonally by hunters There are additional trails and old roads that are illegally accesed by motorized vehicles At the present time, there are no trails in the area designated for ORV/ATV use No locations within Little River have been identified as suitable for the development of an ORV or ATV trail system

Can existing nonconforming uses be effectively mitigated or terminated through removal or rapid natural deterioration? A power line supplies electricity to the Reddish Knob Electronic Site The site contains a microwave link that supplies communications to the U S Naval Communications Station at Sugar Grove, West Virginia At considerable cost, this nonconforming use could be

mitigated through removal and rerouting outside the area The power line could also be excluded from the area by adjusting the northern boundary

Are improvements in the area being affected by the forces of nature rather than humans, and are they disappearing or muted? The timber sale harvest areas are being managed through follow-up site treatments with chainsaws to assure adequate regeneration Wildlife clearings are mowed every other year Wildlife ponds receive maintenance to keep them functioning System roads within the area are periodically inspected and maintained All of the above improvements are evident If left to the forces of nature, they would become muted and disappear over time

The power line and associated right-of-way are maintained and visually evident However, due to its small size and the dense surrounding vegetation, the line is well-hidden and for the most part visually unobtrusive

III. EVALUATION

Capability

Does the area contain the basic characteristics that make it suitable for wilderness designation without regard to its availability for or need as wilderness? Consider the following characteristics in analyzing the quality of the wilderness resource. If these characteristics are determined to be important, describe and refer to them.

Experiential benefits Does the area provide the opportunity for solitude and serenity? Due to its relatively large size, steep topography and dense vegetation the area offers excellent opportunities for solitude and serenity The sights and sounds of human activity are limited to areas along the exterior boundary, along the power line and along interior roads FDR 427 and 1773

People enjoy the area for the panoramic views offered from many of the high ridges and knobs, and for the varied forest types and vegetation, including stands of large trees in the drainage bottoms

Challenge. Does the area offer visitors the opportunity to experience adventure, excitement, challenge, initiative, or self-reliance Is access easy or difficult? Access to the area will be off Forest Service system roads that border the area and system and other trails in the area The area can be easily accessed

The area offers opportunities for adventure, excitement and challenge, similar to other eastern wilderness areas Due to the area's relatively large size, cross country travel would be very challenging None of the area is more than 4 to 5 miles from a place of permanent human habitation

Outdoor Recreation Opportunities What is the area's capability for providing primitive and unconfined types of recreation including·

Camping - There are numerous opportunities for primitive camping

Hunting - The area is currently very popular for deer, bear, wild turkey and squirrel hunting

Fishing - Little River, Big Run and Wolf Run have sufficient flow to sustain a native trout population Little River has been designated as a Native Trout Stream and supports a breeding population of Brook Trout (*Salvelinus fontinalis*) These streams are classified as extremely sensitive to acidic deposition

Mountain Climbing - No known sites are known to be suitable for this activity

Ski Touring - The area is suitable for ski touring but inconsistent and sparse snowfall prevent this activity from ever becoming established

Canoeing - There are no streams or rivers large enough to support this activity

Boating - There are no streams or rivers large enough to support this activity

River Rafting - There are no streams or rivers large enough to support this activity

Backpacking - The area contains a well-developed trail system and is excellent for backpacking. Trips lasting several days are possible

Hiking - The area contains a good system of hiking trails The trail system is especially good for trips lasting several days

Riding - Horseback riding could be encouraged The current trail system would be suitable for trips of several days duration

Photography - The Little River area contains several ridges that afford excellent views of the Shenandoah Valley below In addition, there are several areas containing very large trees that provide good opportunities for nature photography

Special Features:

What is the area's capability to provide outdoor education and scientific study, both formal and informal, in a manner compatible with wilderness? Studies and education on undisturbed Eastern deciduous forests could be done Most of the area can be easily reached in a day

Is there an abundant and varied wildlife population? The area supports black bear, white-tailed deer, wild turkey, squirrels and a number of other game and non-game species typical of the Mid-Appalachian region

Rare inhabitants include Cow Knob salamander, red crossbill, and white alumroot Tennessee pondweed, quaking aspen and paper birch are also present Due to its location on Shenandoah Mountain and its high elevation, the probability is very high that a number of rare species are present in the area A complete flora and fauna inventory has not been conducted

Manageability.

What are the characteristics of the surrounding area including ROS classification, adopted VQO, and present and planned uses? The Little River area is surrounded by lands inventoried as roaded natural under the ROS classification system

On the western and southern boundaries of the area, the foreground lands immediately adjacent to FDR 85 and 95 have an assigned visual quality objective (VQO) of retention Foreground lands just outside the northern boundary of the area are classified primarily as retention and partial retention There is a narrow strip of land bordering the eastern boundary that follows the 2,200 foot contour line with an assigned VQO of modification. Beyond this narrow strip, the land is assigned a VQO of partial retention

Do boundary locations conflict with important existing or potential public uses outside the boundary that might result in demands to allow nonconforming structures and/or activities in the wilderness? The area contains two roads, FDR 1773 and 427, that are used for administrative and/or seasonal hunter access There are several wildlife clearings along both roads that would constitute nonconforming uses should they be included in the area The boundary currently excludes the FDR 427

If necessary, the northern boundary could be located to exclude the existing powerline

The area's perimeter roads are heavily used for dispersed recreation involving the use of motorized equipment (i e chainsaws for fuelwood gathering, portable generators for campsites) The boundary could be located back from these roads (85,95,95A,101) in order to maintain a buffer and to provide opportunites for the public to continue to enjoy dispersed camping and recreational activities that involve motorized equipment

Is it possible to readily and accurately describe, establish, and recognize boundaries on the ground? The southern, western, and most of the northern boundaries could be readily and accurately established on the ground A portion of the north and east boundaries follow the 2,200 foot contour and would be difficult to survey and post There are short, isolated stretches where the boundary goes cross-country and would be more difficult to locate on the ground

Do boundaries, where possible, conform with terrain or other features that constitute a barrier to prohibited use? Most of the boundaries follow roads and large ridges Aside from the rugged terrain that characterizes much of the area, the boundaries themselves do not constitute a barrier to prohibited uses

Do boundaries, to the extent practicable, act as a shield to protect the wilderness environment inside the boundary from the sights and sounds of civilization? Because the boundary follows or parallels heavily traveled roads, it does not shield the immediate area surrounding the roads from the sights and sounds of civilization Land near these borders are popular for dispersed recreation, wood cutting, and other motorized activities that generate noise The interior of the area is well shielded from the sights and sounds of civilization due to the large size of the area, steep topography and dense vegetation

Do boundaries provide adequate opportunity for access and traveler transfer facilities? YES, the area is surrounded by roads that provide excellent opportunities for access

Availability

Describe other (nonwilderness) resource demands and uses.

Recreation - The interior region is used mainly for hunting The peripheral area is used for dispersed camping Hiking, horesback riding, and mountain bike riding are increasing in the area Illegal use of ATV's is also increasing

Information on Wildlife Species, Populations, and Management Needs - The area contains game and non-game species commonly found in the Southern Appalachians Wildlife clearings and waterholes are maintained along FDR 427 and 1773

Water Availability and Use - In the lower elevations, water is available in small streams, except for the driest times of the year In the higher elevations, seeps and scattered springs are the only water sources

Water in the streams is not safe for human consumption since it may contain various aquatic parasites that cause distress to humans Water taken directly from springs and seeps may not contain these aquatic parasites but should be treated prior to drinking

Livestock Operations - *No grazing is permitted in the area*

Timber - Some good quality sawtimber may be found in the interior portion of the area, particularly in the Little River drainage Due to steepness and instability of the soils in the area, however, it is not feasible to harvest the timber without constructing expensive, mid-slope roads and using advanced cable logging or aerial systems The cost of removing the timber would be prohibitive

Around the border of the area, timber stands contain hardwood and white pine sawtimber of fairly good quality, pine pulpwood, and *low quality hardwood suitable for fuelwood These areas could be harvested economically with conventional logging systems Local* demand for these forest products does exist

Based on data in the Continuous Inventory of Stand Conditions (CISC) data base that was used in the existing forest plan, there are approximately 12,000 acres of suitable forest land in the Little River area This amounts to approximately 41 percent of the area's total acreage

Minerals - The mineral potential of the area is not fully known There are surface indications of low grade coal in the Coal Run drainage To date, no interest has been shown in mining the coal No active exploration has taken place

Cultural Resources - While most of the area has virtually no potential to contain prehistoric and/or historic sites, it is interspersed with areas that have a medium to high probability to contain sites The major stream valleys contain flat terrain and landforms suitable for campsites during prehistoric times and for farmsteading following historic settlement Some of the stream valleys offer potential to contain rock shelters or overhangs in areas that have steeply sloping sides

Flood damage in the form of channel scouring and/or debris deposition has probably eliminated or covered sites along the major streams Along North River, there was tremendous deposition in the lower elevations which covered any indications of occupation that may have been present Limited numbers of prehistoric sites have been located on upper terraces adjacent to the river

Upland portions of this area offer less potential for containing prehistoric or historic sites than the valleys. If the ponds shown on topographic maps are natural, there is a possibility for both prehistoric and historic sites Any perennial water source near the flat ridge terrain found in the uplands of this area would offer potential for sites

Authorized and Potential Land Uses - *There are no permanent special uses that involve occupancy of the land at the present time* nor are any anticipated in the future Mineral rights are reserved on three tracts

Management Considerations Including Fire, Insects and Diseases, and Presence of Non-Federal Lands - The area will undoubtedly experience some gypsy moth defoliation over the next 5 years Southern pine beetle damage is limited, but populations are increasing

There have been no large wildfires recently Small arson fires have occurred along the roads adjacent to the boundary

Wilderness designation could make wildfire suppression more difficult, as mechanized equipment would not be allowed in the wilderness under most circumstances Wildfires have been agressively fought since government aquisition of the land As a result, fuel loadings are fairly high If substantial forest mortality results from gypsy moth defoliation, even higher fuel loadings could result

What outputs are currently produced or could be produced in the future? The area provides good opportunities for hunting, especially for deer, bear, turkey and squirrel

The area contains good quality hardwood sawtimber, pine pulpwood, and hardwood fuelwood Some of these areas are relatively flat and close to existing roads and could be economically harvested

Is the area located such that the need for increased water production and/or additional onsite storage is so vital that installation or maintenance of improvements is an obvious and inevitable public necessity? No, the area is not located such that it is critical to providing for the water needs of the area

Would wilderness designation seriously restrict or prevent the application of wildlife and/or threatened and endangered plant or animal management measures of considerable magnitude and importance? NO

Is it a highly mineralized area of such strategic or economic importance and extent that restrictions or controls due to wilderness designation would not be in the public interest? NO

Does the area contain natural phenomena of such unique or outstanding nature that general public access and special development to facilitate public enjoyment should be available? NO

Is the land needed to meet clearly documented resource demands such as for timber, mineral production, or developed recreation? NO

Is the land committed through contractual agreements for use, purposes, or activities not in concert with wilderness requirements? Several small fuelwood timber sales are active outside the boundary along Forest Road 101 Several more small sales are planned along Route 924 for fiscal year 1991 Each of these areas are located just outside the area's boundary

The power line serving the Reddish Knob Electronic Site is under special use permit

Mineral rights are reserved on three tracts within the area

<u>Need</u>

Other Wildernesses.

How far is it to the closest existing wilderness? The northern boundary of Ramseys Draft wilderness is no more than 2 miles from the southern portion of the Little River area

What level of use currently exists in near-by existing wilderness? What trends exist in the use of these areas? According to Recreation Information Management (RIM) use records from 1989, there were a total of 3,100 recreation visitor days of use in Ramseys Draft Trends indicate a steady increase in use of the area Impacts from this use are starting to show up in campsites along Ramseys Draft creek and in the wilderness close to the Mountain House recreation area

Is the population in and around these areas increasing or decreasing? How quickly is it increasing or decreasing? The Little River area is located primarily in Augusta county, Virginia Augusta county's population increased from 53,732 to 56,315 between 1980 and 1990 This represents a 0 5 percent annual rate of increase In Rockingham county to the north, the population increased from 57,038 to 67,133 during the same period, an annual rate of increase of 0 7 percent To the west, in Pendleton county, West Virginia, the population increased from 7,910 to 7,997 between 1980 and 1990 This represents a 0 1 percent annual rate of growth

On a statewide level, the population in the state of Virginia increased at an annual rate of 1 4 percent This is significant because many of Virginia's wilderness users travel considerable distances to get to these areas

Nonwilderness lands.

Are there opportunities for unconfined and primitive recreation experiences on nonwilderness areas in the vicinity? If so, where? Many acres of National Forest land around the Little River area provide primitive recreation opportunities

Habitat.

Are there any biotic species in the area that are directly competing with increasing public use and development? As reported by the Virginia Department of Conservation and Recreation's Division of Natural Heritage, Little River contains a portion of the area

they have recommended for Special Interest Area (SIA) designation called Little Bald Knob The Heritage's Little Bald Knob area is located along the ridge of Shenandoah Mountain and includes those lands that are above the 3,400 foot contour The southern *boundary of the area joins the existing Ramseys Draft Wilderness*

Within the Heritage's proposed Little Bald Knob SIA, the Division has identified four species of concern as listed below These species reside in the immediate vicinity of the Little River, but may or may not reside within the proposed boundary itself

Scientific Name	***Common Name***
Betula papyrifera	Paper Birch
Nannaria shenandoah	Shen Mtn xystidermid milliped
Plethora punctatus	Cow Knob salamander
Poa languida	Drooping Bluegrass

With the exception of Paper Birch, these species are all ranked by the Virginia Natural Heritage Program as being critically imperiled in the state of Virginia Paper Birch is ranked as rare or imperiled in Virginia The millipede *Nannaria shenandoah* is also ranked as being critically imperiled globally Of these four species, Paper Birch, the Cow Knob salamander and Drooping Bluegrass are listed in the state of Virginia as being Recommended for Special Concern This listing reflects the findings of the 1989 Virginia Endangered Species Symposium and is not a legal designation, nor have these species been formally proposed for listing in the state

Finally, the Cow Knob salamander has been proposed to be federally listed The U S Fish and Wildlife Service is seeking additional information on the salamander before making a determination

According to the Heritage Program, "current threats to *Plethodon punctatus* include fragmentation of its range (Pague and Mitchell 1987, Mitchell and Pague in prep) Additionally, clearcuts and planted pine stands appear to be unsuitable habitat (Buhlmann et al 1988, Pague et al, in press) . The maintenance of a corridor of suitable habitat for rare species was emphasized by several recent biologists including Harris (1984) and Norse et al (1986) "

In its recommendations for protection, the Heritage Program states that "the proposed area should be designated as a Special Interest Area (SIA). Management should be suitable for the maintenance of rare species populations and for maintenance of their habitats Since *Plethodon punctatus* and associated rare species occur only on a relatively narrow habitat, fragmentation and genetic isolation of populations can occur Free flow of genetic information must not be impeded "

Little River also contains a portion of the Heritage Program's Reddish Knob proposed SIA In addition to the Cow Knob salamander and the Shenandoah Mountain xystodermid, the Reddish Knob area contains the species listed below As with the Little Bald Knob area, these species may or may not have been found to reside within the Little River roadless area boundary

Scientific Name	***Common Name***
Loxia curvirostra	Red crossbill
Heuchera alba	White alumroot
Trillium pusillium var monticulum	Virginia VA least trillium

The three species listed above are all ranked by the Heritage Program as being critically imperiled in the state of Virginia Red crossbill is globally ranked as being demonstrably secure White alumroot is listed as globally imperiled, although the species is of questionable taxonomic status and is tentatively being treated as a full species Virginia least trillium is ranked as being globally rare It is also listed by the Heritage Program as being of questionable taxonomic status

Management considerations and recommendations for protection for the Reddish Knob area are identical as those for Little Bald Knob

While the Heritage Program has recommended that these areas be managed free from disturbance by clearcutting, off-road vehicles and planting pine, for many of these species, the impact of human use and development is not clearly known If active habitat management is determined to be necessary or desirable, wilderness designation could preclude or make these efforts more difficult

With increased interest in all types of activities on the Forest, the unique biotic species found in the higher elevations of Shenandoah Mountain become increasingly vulnerable to disturbance from humans

Could their needs be provided for through means other than wilderness designation? Yes, the needs of any unique, sensitive, threatened or endangered species requiring freedom from human disturbance could be met through establishment of Research Natural Areas, Special Management Areas, or by allocating the area to a management prescription designed to limit or exclude significant human activity

The George Washington National Forest is cooperating with the U S Fish and Wildlife Service in developing a conservation strategy for the Cow Knob salamander in the form of a pre-listing recovery plan This plan will specify standards by which the area will be managed to ensure the viability and long conservation of this species

Is there a need to provide a sanctuary for biotic species that cannot survive in less than primitive surroundings? This is unknown at this time However, studies and data collection are being conducted at this time to determine the habitat needs of many of these species

George Washington National Forest
Warm Springs and James River RD

MILL MOUNTAIN ROADLESS AREA

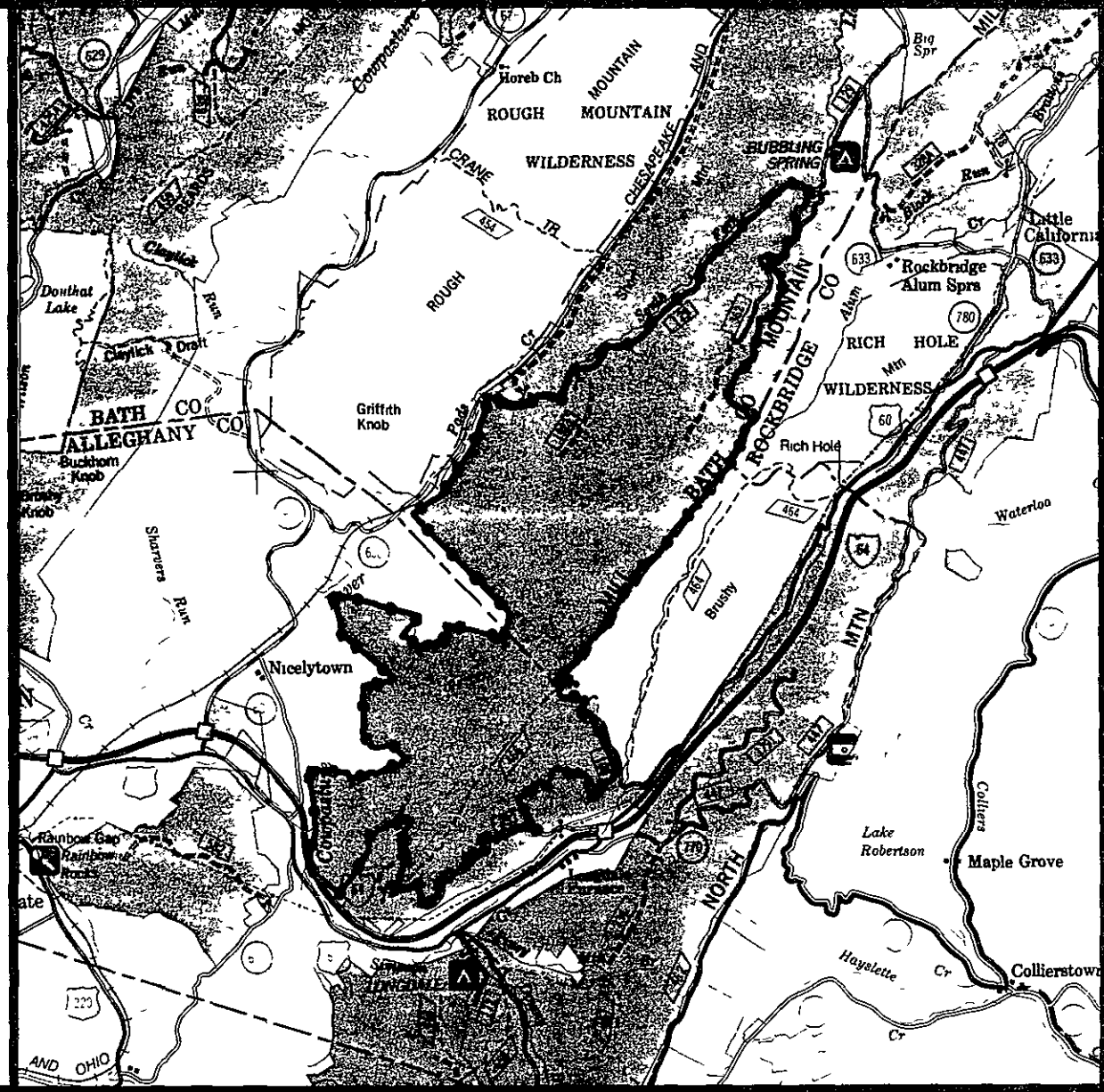
Scale

1:126,720

1/2 inch = 1 mile

N

Roadless Area



MILL MOUNTAIN ROADLESS AREA

I DESCRIPTION

Acres. approximately 10,826

Location and vicinity: Mill Mountain is located on the James River and Warm Springs Ranger Districts of the George Washington National Forest in Alleghany and Bath Counties, Virginia, north of Interstate 64 at Longdale, Virginia

Describe access to the area including roads and trails leading to the area. The south end of Mill Mountain can be accessed by Forest Service Roads 108 and 333 Both of these roads are open to the public from April to January each year

Access to the north side of Mill Mountain is by the Pads Creek Road, Forest Service Road 129, which is open to the public all year There are two roads off of Forest Service Road 129 which provide access to the lower slopes of Mill Mountain Forest Service Road 1923 (1 9 miles) and Forest Service Road 362 (1 5 miles) These two roads are not open to public use

At the present time there is a right-of-way located across National Forest land just east of the Cowpasture river in the northernmost section of the part of Mill Mountain located within Alleghany County This right-of-way cannot be eliminated

There is one Forest Service System trail located in the south end of Mill Mountain The White Rock Tower Trail runs from the west end of Forest Service Road 333 following the ridge line of Mill Mountain to the northeast and ends on Forest Service Road 108

General description of the area's geography. Mill Mountain lies between the Rough Mountain and Rich Hole Wildernesses in the Valley and Ridge Physiographic Province of Virginia This roadless area is located on the northern aspect of Mill Mountain The southwestern part of the area joins private land along the Cowpasture River Valley. The southern boundary lies within 1/4 mile of Interstate 64

General description of the area's topography Mill Mountain contains mountain ridges with parallel drainages in a contorted arrangement with spur ridges and associated small drainages spurring of the major ridges Elevations range from about 1200' on the Southeastern edge near the Cowpasture River to 3310' on top of Mill Mountain in the East central portion Slopes vary from moderate to very steep and are dissected by numerous small and moderately sized streams

General description of the area's vegetation, including the ecosystem type. Vegetation on Mill Mountain consists of a mixed eastern hardwood forest Oaks and hickories occur on northern and eastern slopes, and on other moist sites The most fertile sites, usually in the deeper, more moist drainages with good soils, contain cove hardwoods including black and red oak, birches, ashes and maples The least fertile sites, on ridgetops and southern and western exposures, contain oaks, yellow pines and white pines including bear oak, a scrub oak species

Understory vegetation also varies with aspect and moisture regime of a site Riparian vegetation exists along perennial and larger intermittent streams The driest sites contain fetterbush, scrub oaks, and yellow and white pine regeneration Intermediate sites contain pine and hardwood regeneration, understory tree species such as dogwood and black gum and sparse amounts of herbaceous plants

Key attractions, if any, including sensitive wildlife and scenic landmarks. There are no significant landforms, or other prominent features in Mill Mountain The land is generally steep and rugged, except for some less steep lands located on the lower slopes of Mill Mountain on the north side along Forest Service Road 129 Bubbling Springs Recreation Area adjoins the north end of Mill Mountain

II. INVENTORY

Human Influence

To what degree have humans and past and present human activity affected natural ecological processes and conditions? Except for the deeper, most rugged drainages, and the dry sites on flat ridges which contain scrub timber species, most of Mill Mountain was cut over in the late 1800s and early 1900s Most stands are now about 90 years old Mill Mountain burned frequently prior to government acquisition

Along the northern aspect of Mill Mountain, there have been several stands harvested since 1981 A total of 18 stands were harvested within an area of approximately 7,000 acres. The stand size averaged approximately 40 acres There are several grassy, man-made wildlife clearings and several man-made wildlife water holes within Mill Mountain

These activities have not affected natural ecological processes and conditions in Mill Mountain to a significant degree

To what degree is the area natural or natural appearing and free from disturbance? Except for the recent timber harvesting and wildlife improvements, Mill Mountain appears to be in a natural condition

If the area's ecological processes and/or natural appearance have been altered by past or present human activity, is the land regaining a natural, untrammeled appearance? Except for recent timber harvesting, Mill Mountain appears natural to the average visitor

Does the existing or attainable National Forest System ownership pattern, both surface and subsurface, ensure perpetuation of identified wilderness value? All of the surface and subsurface resources within Mill Mountain are federally owned

Is more than 15 percent of the area in non-native vegetation? NO

Improvements, Structures, and Nonconforming Uses

Are any of the following types of areas, features or nonconforming uses present? If so, where?

Areas with evidence of historic mining at least 50 years old (Do not include areas of significant current mineral activity)· NONE

Areas under current mineral lease that contain a "no surface occupancy" stipulation· NONE

Areas under current mineral lease where the leasee has not exercised development and occupancy rights: NONE

Recreation improvements such as occupancy spots or minor hunting or outfitter camps. There are primitive, dispersed camp spots scattered throughout Mill Mountain

Timber harvest areas where logging and prior road construction are or are not evident: There are eighteen timber harvest cutting units which have been logged since 1981 Temporary roads and skid trails within these areas have been revegetated These harvest areas and associated roads and skid trails are very evident

Some of the old roads used for logging and access to lands prior to government acquisition still exist These old woods roads are not maintained, but the roadways are still evident and being used by four-wheel drive vehicles

Cultural treatments involving plantations or plantings: 18 stands containing about 720 acres have been chainsaw site prepared since 1981

Private inholdings in the area· NONE

Dwellings on private inholdings· NONE Some of the private land outside the southwestern boundary of Mill Mountain contain weekend cabins

Nonconforming structures and improvements· NONE

Ground-return telephone lines· NONE

Watershed treatment areas· NONE

Roads· Forest Service Road 1923 enters the area in a southeast direction from Forest Road 129 It is 1 9 miles long and is closed to *public use*

There is a non-system road which is used as a right-of-way from the private land along the Cowpasture river across Mill Mountain to private land in the northernmost section of the Mill Mountain located in Alleghany County

In addition to Forest Service System, there are about 7 6 miles of non-system open woods roads in the area The open system and non-system roads in Mill Mountain are popular off-highway vehicle routes and are frequently traveled Old logging roads in the southern edge of Mill Mountain are used heavily, although illegally by all-terrain vehicles

Can existing nonconforming uses be effectively mitigated or terminated through removal or rapid natural deterioration?

It would be very time consuming and costly to eliminate all-terrain vehicle use in Mill Mountain Several trails used illegally come off adjoining private land within the southern 1/4 of Mill Mountain Curtailing illegal use of motorized vehicles will be a major undertaking

Are improvements in the area being affected by the forces of nature rather than humans, and are they disappearing or muted? Stands harvested during the 1980s are being managed through follow-up site treatments with chainsaws to assure adequate regeneration Wildlife clearings are mowed every other year Wildlife ponds receive maintenance to keep them functioning System roads within Mill Mountain are either closed and re-vegetated or receive minimal, if any, maintenance Periodically closed and re-vegetated roads are inspected and re-seeded All of the above improvements are evident If left to the forces of nature, they would eventually become muted and disappear over time

III. EVALUATION

Capability

Does the area contain the basic characteristics that make it suitable for wilderness designation without regard to its availability for or need as wilderness? Consider the following characteristics in analyzing the quality of the wilderness resource If these characteristics are determined to be important, describe and refer to them.

Experiential benefits. Does that area provide the opportunity for solitude and serenity? Mill Mountain lies between the Rough Mountain and Rich Hole Wildernesses The addition of Mill Mountain would provide a large area of the George Washington National Forest where there would be opportunities for solitude and serenity

There will, however, be some noise pollution within Mill Mountain A main line of the Chesapeake and Ohio railroad runs just north of Mill Mountain Trains can be heard in approximately 80 percent of the roadless area Within the southern end, vehicles can be heard traveling on Interstate 64 Near the Bubbling Springs Recreation area, there is a possibility that some noise could be heard from the recreation area in the extreme North portion of Mill Mountain Road noise can be heard from Virginia Route 633

Challenge. Does the area offer visitors the opportunity to experience adventure, excitement, challenge, initiative, or self-reliance. Is access easy or difficult? Although Mill Mountain can be easily accessed from boundary roads, its location between Rough Mountain and Rich Hole Wildernesses offer opportunities for adventure, excitement and challenge

Outdoor Recreation Opportunities What is the area's capability for providing primitive and unconfined types of recreation including

Camping - Mill Mountain offers numerous places for primitive camping

Hunting - Mill Mountain is currently very popular for deer, bear, wild turkey and squirrel hunting

Fishing - There are fishable populations in South Fork and Cowpasture River Both of these rivers are on the edge of Mill Mountain

Mountain Climbing - There are a few small rock outcroppings within Mill Mountain which could provide short rock climbs

Ski Touring - NONE

Canoeing - NONE

Boating - NONE

River Rafting - NONE

Backpacking - Mill Mountain is excellent for backpacking trips lasting up to several days

Hiking - Mill Mountain contains a good system of hiking trails The trail system is especially good for day-trips

Riding - Horseback riding is becoming an increasingly popular activity in Mill Mountain The current trail system would be suitable for trips of less than a day's duration or over night trips

Photography - There are good opportunities for photography

Special Features:

What is the area's capability to provide outdoor education and scientific study, both formal and informal, in a manner compatible with wilderness? Mill Mountain can be easily accessed for such activities

Is there an abundant and varied wildlife population? Mill Mountain supports black bear, white tailed deer, wild turkey, squirrels and a number of other game and non-game species typical of the Southern Appalachians

Manageability:

What are the characteristics of the surrounding area including ROS classification, adopted VQO, and present and planned uses? The surrounding ROS classifications are generally roaded, natural to the north and preservation to the south (Rich Hole Wilderness) The surrounding VQO is generally modification, partial retention and retention

Do boundary locations conflict with important existing or potential public uses outside the boundary that might result in demands to allow nonconforming structures and/or activities in the wilderness? There is a right-of-way across Mill Mountain to access private land If the boundary were changed to remove this right-of-way, a small block of Forest Service land would be isolated

Is it possible to readily and accurately describe, establish, and recognize boundaries on the ground? YES Boundaries could be readily and accurately established on the ground Boundaries adjoin private land about 1/4 way around the roadless area For the remainder of Mill Mountain, the boundary follows roads or a ridgeline which is also the wilderness boundary

Do boundaries, where possible, conform with terrain or other features that constitute a barrier to prohibited use? Given the current level of ATV and ORV use in the area, it is quite obvious that the area's boundaries would not serve as a barrier to prohibited uses The eastern boundary of the area also serves as the boundary for the existing Rich Hole Wilderness This would help prevent prohibited uses originating along the eastern boundary of the area

Do boundaries, to the extent practicable, act as a shield to protect the wilderness environment inside the boundary from the sights and sounds of civilization? Since Mill Mountain lies between the Rough Mountain and Rich Hole Wildernesses, the roadless area is partially shielded from the sights of civilization However, due to the closeness to Interstate 64 and the railroad right-of-way, the sounds of human activity will be fairly common

Do boundaries provide adequate opportunity for access and traveler transfer facilities? YES

<u>Availability</u>

Describe other (nonwilderness) resource demands and uses

Recreation - The interior region of Mill Mountain is used for hiking, hunting, dispersed camping, horseback riding, mountain bike riding, stream fishing, berry picking, sight seeing, ORV and ATV travel

Information on Wildlife Species, Populations, and Management Needs - Deer, turkey, and bear populations are average for the ridge and valley province

Water Availability and Use - In the higher elevations, seeps and scattered springs are the only water sources All drainages contain *either perennial or intermittent streams*

There is a small natural pond located in the north central part of Mill Mountain

Livestock Operations - NONE

Timber - Due the ruggedness of the terrain and lack of existing interior roads in the higher elevations, demand for timber in Mill Mountain is low On the lower and mid-slopes, there are three proposed timber sales and associated road work Some of the drainages contain sawtimber of good quality The lower slopes are not as steep as the upper slopes and there are some good opportunities for use of the timber resource

Minerals - There is no anticipated demand for leasing of federal minerals

Cultural Resources - NONE KNOWN

Authorized and Potential Land Uses - NONE

Management Considerations Including Fire, Insects and Diseases, and Presence of Non-Federal Lands - Mill Mountain will probably under go defoliation by the gypsy moth to varying extent over the next 6 years

There have been no large, human-caused fires recently

What outputs are currently produced or could be produced in the future? Mill Mountain provides good opportunity for hunting, especially for deer, bear, turkey and squirrel Some of these popular game species would benefit, except squirrel, by habitat manipulations that provide openings

Mill Mountain contains good quality hardwood sawtimber and pine pulpwood which is in demand Presently, there are three proposed timber sales within Mill Mountain A large percentage of the timber within Mill Mountain is suitable for timber harvesting

Is the area located such that the need for increased water production and/or additional onsite storage is so vital that installation or maintenance of improvements is an obvious and inevitable public necessity? NO

Would wilderness designation seriously restrict or prevent the application of wildlife and/or threatened and endangered plant or animal management measures of considerable magnitude and importance? NO

Is it a highly mineralized area of such strategic or economic importance and extent that restrictions or controls due to wilderness designation would not be in the public interest? NO

Does the area contain natural phenomena of such unique or outstanding nature that general public access and special development to facilitate public enjoyment should be available? NO

Is the land needed to meet clearly documented resource demands such as for timber, mineral production, or developed recreation? NO

Is the land committed through contractual agreements for use, purposes, or activities not in concert with wilderness requirements? NO

Need

Other Wildernesses

How far is it to the closest existing wilderness? The Rich Hole Wilderness forms the eastern boundary of Mill Mountain The Rough Mountain Wilderness lies less than 1/4 mile to east

What level of use currently exists in near-by existing wilderness? What trends exist in the use of these areas? Rough Mountain and Rich Hole Wildernesses receive low use

Is the population in and around these areas increasing or decreasing? How quickly is it increasing or decreasing? Mill Mountain is split between Bath and Alleghany Counties in Virginia Bath County's population decreased from 5,860 to 5,026 between 1980 and 1990 Alleghany County's population also decreased during this time period

Studies of visitors to the St Marys wilderness on the Pedlar Ranger District have indicated that the visitors often travel up to 100 miles to get to the area. In light of this, it is useful to look at the population of the state of Virginia and West Virginia Between 1980 and 1990, the population of the State of Virginia increased at an annual rate of 1 4 percent while the population for the state of West Virginia decreased at an annual rate of 0 4 percent

Nonwilderness lands:

Are there opportunities for unconfined and primitive recreation experiences on nonwilderness areas in the vicinity? If so, where? There are many acres of National Forest Land that join Mill Mountain on all sides that are suitable for primitive recreation experiences

Habitat:

Are there any biotic species in the area that are directly competing with increasing public use and development? A survey for rare flora and fauna in Mill Mountain has not been completed At this time, there are no known biotic species in Mill Mountain that are directly competing with increasing public use and development

Could their needs be provided for through means other than wilderness designation? NOT APPLICABLE

Is there a need to provide a sanctuary for biotic species that cannot survive in less than primitive surroundings? There is not a need to provide a sanctuary for biotic species that cannot survive in less than primitive surroundings

George Washington National Forest
Pedlar Ranger District

MOUNT PLEASANT ROADLESS AREA

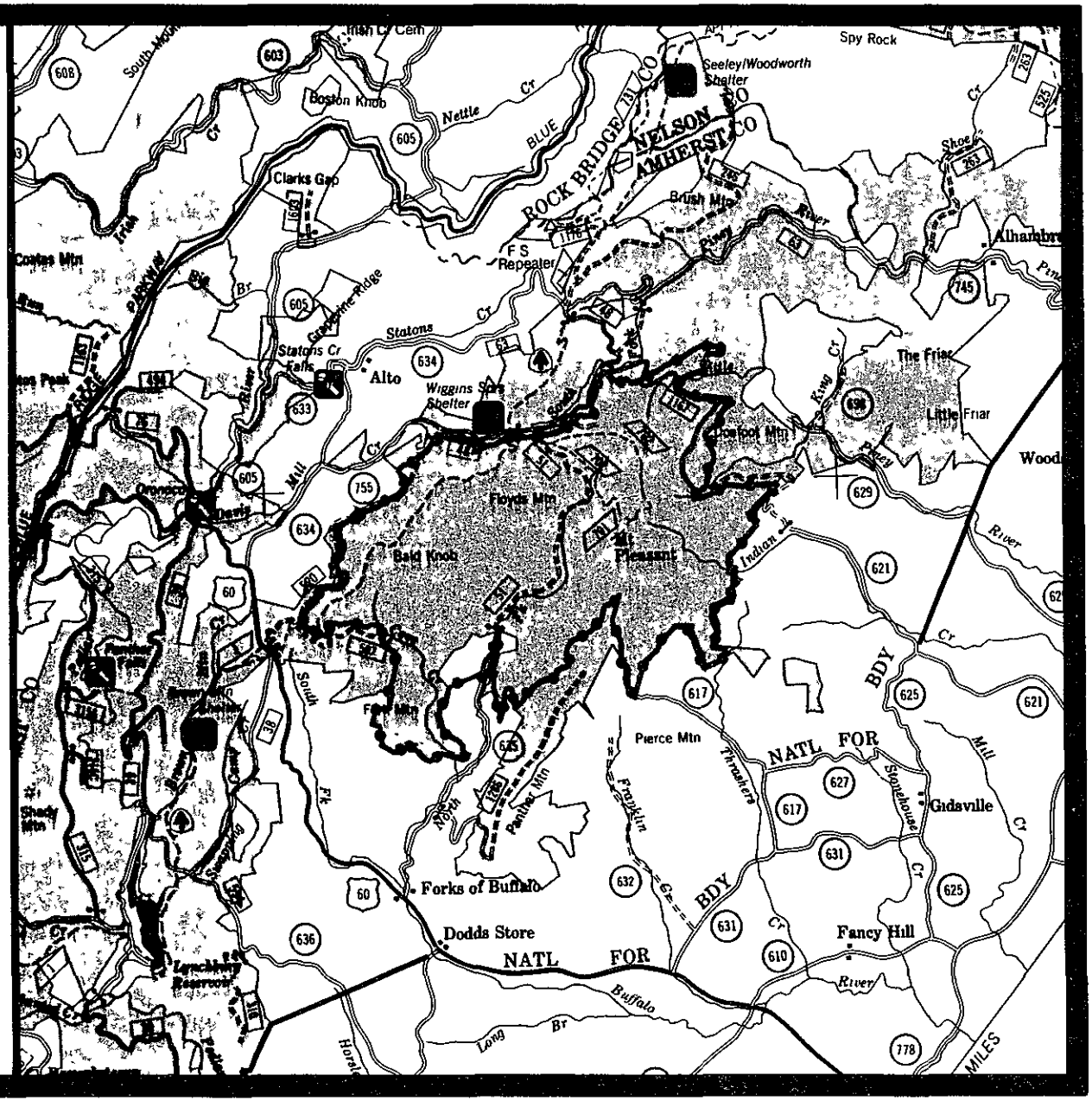
Scale

1:128,720

1/2 inch = 1 mile

N

Roadless Area



MOUNT PLEASANT ROADLESS AREA

I DESCRIPTION

Acres: approximately 8,905

Location and vicinity MOUNT PLEASANT is located in the east central portion of the Pedlar Ranger District, George Washington National Forest in Amherst County, Virginia This area lies on the east side of the Blue Ridge Mountains, between SR 60 and South Fork of the Piney River, and is approximately 6 miles east of Buena Vista and 5 miles northwest of Lowesville, Virginia

The proposed boundary expands the current Special Management Area (SMA) No 20 (Mount Pleasant) on the north and west sides Thus, the boundary, for the most part, is coincident with the NF boundary and the SMA on one-half of the south side and all the east side, bounded by FDR 1167, FDR 42 (from FDR 1167 to FDR 520), and FDR 520 (from FDR 42 to FDR 507) on the north side, and meanders along FDR 507, the ridge of Fletcher Mountain, the NF boundary, and around small private inclusions for the remaining portion of the south side

Describe access to the area including roads and trails leading to the area. Access to the boundary is possible on SR 635, FDR 48 (Hog Camp), FDR 507 (Cove Creek), FDR 520 (Cow Camp), FDR 1167 (Coon Bridge), across right-of-ways FDR 513 (Tolly Gap) and FDR 1286 (Panther Mountain), and by means of the Appalachian National Scenic Trail There are two other rights-of-way across private land which also provide access

General description of the area's geography The geologic maps indicate that the area is underlain chiefly by igneous and metamorphic rocks of Precambrian age and some clastic and volcanic rocks of Cambrian age The dominant structural feature is the Blue Ridge-Catoctin Mountain anticlinarium within the Blue Ridge Province of the Appalachian Mountain System

The area can best be characterized as steep and rocky, with sites ranging from poor to good Soils are generally deep, well drained, and moderately to highly productive Located on convex ridges to very steep, smooth and concave sideslopes, they have a moderate to severe erosion potential The main soil association is Hayesville-Porters-Lew, and these soils have the potential for high sediment discharge, if left exposed

General description of the area's topography The majority of the area is steep, rugged terrain with numerous springs and steep cascading streams, surface boulders, massive rock outcrops, cliffs, and pinnacles Except for locations in the northern third of the area, most of the valleys have steep side-slopes Pompey Mountain, Mount Pleasant, the highest mountain on the Pedlar, and Cole Mountain are unique peaks with elevations over 4,000 feet above sea level Elevations range from a low of about 1,400 feet to slightly over 4,000 feet NOTE Pompey Mountain and Mount Pleasant elevations are slightly different than indicated on the topographic map, since Mount Pleasant is the higher mountain

Landform varies from narrow "V" shaped to broad "U" shaped drainages Stream bottoms are generally solid rock or cobble and large boulders, and some have stretches of subterranean flow The streams that drain to the east of Little Mount Pleasant, such as Indian Creek, George's Creek, and South Fork of Piney River, are tributaries of the Tye River, those draining south, including Cove, Little Cove, Rocky, and Thrashers, are tributaries of the Buffalo River, the miscellaneous waters north of the Appalachian Trail empty into the Pedlar River All are within the watershed of the James River Basin of the Middle Atlantic Drainage Area

General description of the area's vegetation, including the ecosystem type. There is a wide variety of site conditions ranging from from poor to good, and the area supports Eastern deciduous hardwoods on steep, inaccessible slopes

The area is entirely forested, except for the old open fields north and southeast of Cole Mountain The major species and associations in the area include chestnut oak, pitch pine, and mixtures of chestnut oak-scarlet oak-pitch pine on the drier peaks, ridges and slopes, combinations of red oak-white oak-hickory, chestnut oak, and some white pine are present on a range of sites, yellow poplar, Northern red oak, white oak, and a small amount of sugar maple, beech, yellow birch occupy the lower cove sites The understory, usually dense, is composed of laurel and rhododendron blackberry and coralberry are also a major component of the understory The area around the open fields on Cole Mountain has a mixture of landform and many vegetation types

Key attractions, if any, including sensitive wildlife and scenic landmarks The area is well known for its prominent mountains including Mount Pleasant, Pompey Mountain, and Cole Mountain, the very popular Pompey and Mount Pleasant loop hiking trail, and the famous Appalachian National Scenic Trail Some of the best views on the Ranger District are possible from Cole Mountain and Mount Pleasant Other features include the small virgin groves of hardwood forest in Little Cove Creek, the wild trout streams, and the large open vistas around Cole Mountain The historic rock fences of the 1850s, located on Cole Mountain and in the headwaters

of Rocky Branch and Cove Creek, are also of special interest The "Old Hotel" site, located on the east side at the base of Cole Mountain was used prior to 1907

A formal flora or fauna inventory has not been completed The abundance of wildflowers in the area make it a popular wildflower viewing and study area The Virginia Native Plant Society has reported the presence of a potential state or national champion rhododendron on Mount Pleasant This report has not been confirmed

Northern meadow-sweet, a very rare plant in Virginia is found at the top of Mount Pleasant

The adjacent South Piney River riparian area has been surveyed for five years to detect the possible presence of the federally endangered Northern flying squirrel None have been found The probability that this species occurs in the Mount Pleasant area is small

A population of New England cottontail thrives in the open fields Since vast acreage of non-forest is scarce on the National Forest, these old fields are very popular for hunting indigenous small game animals

Finally, 1990 was the third consecutive year that Cole Mountain was used as a Peregrine Falcon hack site It is hoped that the Federally Endangered falcon (Falco peregrinus anatum) will return and use the cliffs of Mount Pleasant for nesting sites

II INVENTORY

Human Influence

To what degree have humans and past and present human activity affected natural ecological processes and conditions? The activities of prehistoric man are not evident However, the old rock fences, home sites, grazing of hogs and cattle, open fields, and timber management activities demonstrate man's occupation of the land during the last 200 years The network of old primitive roads, some possibly old railroad beds, were developed when the area's timber was harvested by the Woodson Railroad Company, South River Lumber Company, and others between 1900 and 1925 Other harvesting occurred during the 1950s and 1960s by the Owen's Illinois Company, thinnings and harvest cuts, such as the Mitchell Cove Sale, continued during the 1970s Timber sale activities were common in the northern and western portions during the early to mid-1980s These sales include the Fletcher Mountain Sale (64 Acres), Wedderburn Sale (20 acres), and George's Creek Timber Sale (60 acres) During this period, road access was improved Various silvicultural treatments with hand tools followed the timber harvesting Wildlife management focused on maintenance of habitat, primarily open areas, at many of the old home sites Approximately 50 acres around Cole Mountain have been planted to White Pine, Autumn Olive and Sawtooth Oak

Historically, there were approximately 200 acres in an open/cleared condition within the area that were used for grazing Today, there remains about 140 acres on Cole Mountain, originally noted as "Cold" Mountain The last grazing occurred immediately prior to government acquisition in the late 1970s During the last two years, these Cole Mountain open areas, or balds, have been maintained by mowing, hand cutting and prescribed fire These areas are located within the Appalachian Trail Management Area (No 10) and are a key feature along the Trail where open areas that serve as vista points are relatively scarce

Government acquisition started in 1920 and continued through 1936 Other additions were made between 1977 and 1979, 1981 and 1983, and in 1986

The Appalachian National Scenic Trail was developed during the 1930s Construction of the Cow Camp Shelter was completed in 1988 The Hotel Trail was completed by the YCC's in 1989 Continential's Electronic Site and their associated telephone lines were removed by 1985

To what degree is the area natural or natural appearing and free from disturbance? The area within the current SMA boundary appears relatively wild, even though there is limited road access through the middle of the area on FDR 51, and a past history of considerable disturbance Recent evenaged timber management activities on the western and northern portions, outside the current SMA boundary, are apparent and dominate the landscape The old road beds throughout the area are healing and will remain visible for many years to come The Appalachian Trail and FDT 575 (Old Hotel Trail) are actively maintained and used

If the area's ecological processes and/or natural appearance have been altered by past or present human activity, is the land regaining a natural, untrammeled appearance? YES The degree of recovery varies with the date and location of the various disturbances

Does the existing or attainable National Forest System ownership pattern, both surface and subsurface, ensure perpetuation of identified wilderness value? A very small portion of Tract N-1679H, approximately 25 acres, is located within the proposed

boundary There is a mineral reservation through the year 2016 on Tract N-1679H for oil and gas This tract could easily be excluded from the area through a minor boundary adjustment There are no current mineral leases in the area.

Is more than 15 percent of the area in non-native vegetation? NO

Improvements, Structures, and Nonconforming Uses

Are any of the following types of areas, features or nonconforming uses present? If so, where?

Areas with evidence of historic mining at least 50 years old (Do not include areas of significant current mineral activity): NONE

Areas under current mineral lease that contain a "no surface occupancy" stipulation: See Section II A 4 above

Areas under current mineral lease where the lessee has not exercised development and occupancy rights. There are no existing leases in the aera

Recreation improvements such as occupancy spots or minor hunting or outfitter camps. The Cow Camp Trail Shelter is located southeast of Cow Camp Gap and includes a picnic table, fire grill, and pit toilet The Appalachian National Scenic Trail, Old Hotel Trail, and FDR 51 are currently open access routes There are primitive, dispersed camping sites scattered throughout the area Signs are present along the trails The Pompey and Mt Pleasant Trailhead, where an information board is installed, is a short distance inside the boundary, off FDR 51

An adjustment of the western boundary immediately to the east of the Appalachian Trail would avoid the significant impacts that wilderness designation would have on management of the Trail Such an adjustment would not significantly reduce the size of the proposed area

Timber harvest areas where logging and prior road construction are or are not evident: Both timber harvesting and road developments are very evident in those areas disturbed since the mid-1970s Areas of activity prior to that time are much less noticeable

Cultural treatments involving plantations or plantings: Timber and wildlife management treatments and habitat improvements occurred on old homesites, old open fields, and regeneration cuts Approximately 1,000 acres are within the 20-year age class, reflecting harvest cuttings and silvicultural treatments promoting natural hardwood regeneration The most recent plantings are the 28 acres of white pine planted in 1983 in the old fields east of Cole Mountain

Private inholdings in the area None within the proposed boundary The current SMA includes two private deed exceptions, consisting of 6 4 acres, from the Mays Acquisition of 1986

Dwellings on private inholdings. NONE

Nonconforming structures and improvements. See "f" above The Cole Mountain fields are being maintained through a cooperative effort with the Natural Bridge Appalachian Trail Club and Appalachian Trail Conference The AT is "white blazed", the Pompey and Mount Pleasant Loop Trail is "blue blazed"

Ground-return telephone lines: NONE

Watershed treatment areas: Some erosion control work was performed on FDR 51 in 1990

Roads. FDR 51 is a system road that, at one time, bisected the area The original road ran north/south through the heart of the area but the middle section has been obliterated and is now part of Falling Creek At the present time, segments of FDR 51 enter the area from the north and the south These segments are currently maintained to D-level standards The north segment of the road extends into the area for 1 mile and the south segment extends into the area for 3/4 miles The road is opened on the first day of trout fishing season and closed at the end of bear hunting season Because the road no longer goes all the way through the area, use is relatively low Those hunters and fishermen that use the road rely on it to provide access to the interior portion of the area

ORV/ATV Use. FDR 51 is a popular four-wheel drive route There are no trails designated for ORV or ATV use A group of interested citizens have identified the extreme western portion of the Mt Pleasant area as part of a proposal for the development of ORV/ATV trail systems within the George Washington National Forest

Can existing nonconforming uses be effectively mitigated or terminated through removal or rapid natural deterioration? The Appalachian Trail improvements may represent a desirable existing use which provide for visitors well being and safety The Appalachian Trail's basic purpose and character are primitive in nature and are generally consistent with wilderness management Other trails in the area could remain and be maintained according to wilderness standards FDR 51 could be obliterated and revegetated at great cost but would remain visually evident for many years to come Given the traditional, established use of FDR 51, permanent closure would be highly controversial The trailhead for Pompey and Mt Pleasant Loop could be located outside the area through minor boundary adjustments

Are improvements in the area being affected by the forces of nature rather than humans, and are they disappearing or muted? Some of the improvements mentioned above are currently being maintained for long-term needs and are visually evident The closed logging roads (old and new) are healing over, the older ones are naturally less obtrusive

III EVALUATION

Capability

Does the area contain the basic characteristics that make it suitable for wilderness designation without regard to its availability for or need as wilderness? Consider the following characteristics in analyzing the quality of the wilderness resource If these characteristics are determined to be important, describe and refer to them

Experiential benefits. Does the area provide the opportunity for solitude and serenity? Some extraordinary opportunities exist in this area for solitude and serenity This area is very popular for various forms of dispersed recreation Private land developments are readily visible from Mount Pleasant and Cole Mountain The Rocky Mountain Electronic Site, 3 to 4 miles to northwest, is highly visible

Challenge Does the area offer visitors the opportunity to experience adventure, excitement, challenge, initiative, or self-reliance. Is access easy or difficult? The Appalachian, and Pompey and Mount Pleasant Loop Trails provide good access to their respective areas Off-trail, cross-country access can be extremely difficult and very hazardous in some areas

Outdoor Recreation Opportunities What is the area's capability for providing primitive and unconfined types of recreation including

Camping - Good sites are present along the AT, "blue blazed" trails, old roads, open fields, and old home sites

Hunting - The area is popular for hunting both large and small game animals, and sustains moderate hunting pressure in those accessible areas Heavier hunting pressure is exerted along the boundary, from FDR 48, FDR 520, FDR 1162, and FDR 507, where access is relatively easy

Fishing - Cove Creek, Little Cove Creek, and Rocky Branch are Class II streams which provide excellent opportunities for native trout fishing According to special State regulations, only single hook, artificial lures may be used, no bait may be in possession while fishing these waters, and no fish less than 9 inches may be harvested These streams are classified as sensitive to acidic deposition

Mountain Climbing - Suitable terrain is available on Mount Pleasant, although this activity isn't common in the area

Ski Touring - Snowfall is normally insufficient, however, Cole Mountain might offer some limited seasonal opportunities

Canoeing - There are no streams or rivers large enough to support this activity

Boating - There are no streams or rivers large enough to support this activity

River Rafting - There are no streams or rivers large enough to support this activity

Backpacking - Opportunities are excellent along the Appalachian Trail Cross-country travel opportunities exist for the experienced backpacker

Hiking - The 5 miles of Pompey and Mt Pleasant, 2 miles of Hotel Trail, and the approximate 5 miles of Appalachian Trail provide ample opportunities The trails are in good condition and several loop hikes are possible

Riding - Some limited opportunities exist, until some of the old roads become overgrown with brush and impassable Opportunities are somewhat limited because of the prohibited use of saddle stock in association with the Appalachian Trail

Photography - There are many excellent opportunities for panoramic and close-up photography

Special Features:

What is the area's capability to provide outdoor education and scientific study, both formal and informal, in a manner compatible with wilderness? With good trail access, the Mount Pleasant Area lends itself well to both formal and informal scientific study

Is there an abundant and varied wildlife population? *The area provides good habitat for a variety of game and non-game animals,* especially where there have been some diversity modifications through timber management and wildlife habitat improvements The old fields maintained as open areas support grouse and rabbit Deer and turkey prevail where there have been some habitat changes in the area or near private farms Squirrel habitat is enhanced by plentiful den trees and mature forest conditions The remote portion is ideal for bear. Featured species are turkey and bear in the current Special Management Area All primitive campsites around and near the boundary are used to capacity by hunters during deer and turkey seasons

Manageability

What are the characteristics of the surrounding area including ROS classification, adopted VQO, and present and planned uses? Mount Pleasant is surrounded by a significant amount of private land on the south, east, and a portion of the west side ROS on that portion of NF near the area boundary is roaded natural (RN) VQO varies from retention (R) on Tar Jacket Ridge to partial retention (PR) and modification (M), depending on the distinctive landscape and aesthetic values along the travel routes and from viewing points

Multiple-use management is expected to continue on the National Forest surrounding the area The Friars and the Priest areas, also being evaluated for their wilderness potential, are, respectively, located approximately 1 mile and 5 miles to the northeast

The private land will remain in use for pasture and farms, woodlots, residences, and hunting camps There are downstream benefits from the North Fork of the Buffalo River, Franklin Creek, and Thrashers Creek for recreational purposes These watersheds also serve two Soil Conservation Service impoundments which have been developed for county recreational purposes

Do boundary locations conflict with important existing or potential public uses outside the boundary that might result in demands to allow nonconforming structures and/or activities in the wilderness? Even though development is likely to continue on private land around and near the boundary, encroachments are not expected to be a serious problem or concern

The AT, inside and outside the proposed boundary, is maintained with mechanized equipment The Natural Bridge ATC has a considerable length of trail to maintain with a limited volunteer work force on the Pedlar District Trail maintenance requirements in this area would be difficult for the club to accomplish without power tools Management of the Cole Mountain Field is continuously being given more attention along the trail corridor Wilderness designation would eliminate the opportunity to manage this unique portion of the trail

If those values along the AT are determined to be of greater importance, the western boundary could be moved to the east to exclude the AT and coincide with the SMA boundary, which recognizes the need to manage the AT as a separate management area *Wilderness-like conditions would continue to prevail along the AT corridor*

Is it possible to readily and accurately describe, establish, and recognize boundaries on the ground? *The majority of the* boundary could be easily established through surveys

Do boundaries, where possible, conform with terrain or other features that constitute a barrier to prohibited use? The heavy undergrowth and typically rugged forested terrain along the roads and general forested area hinder entry

Do boundaries, to the extent practicable, act as a shield to protect the wilderness environment inside the boundary from the sights and sounds of civilization? Yes, except along the main travel routes along the north and west side Views from the high terrain are not limited by the boundary, and civilization is readily apparent from the vistas of Cole Mountain and Mount Pleasant

Do boundaries provide adequate opportunity for access and traveler transfer facilities? YES

Availability

Describe other (nonwilderness) resource demands and uses.

Recreation - As previously noted, this area provides opportunities for dispersed recreation including hiking, camping, fishing, hunting, and viewing scenery ATV trespass in isolated areas is infrequent and is limited to areas where access is available to the boundary Mount Pleasant is considered a prime site for hang-gliding, however, it is not considered practical, due to the lack of vehicle access to the summit

Information on Wildlife Species, Populations, and Management Needs - The area contains game and non-game species commonly found on the eastern side of the Blue Ridge Mountains The current "open area management practices" are very beneficial to those species which favor a more open forest condition The area's featured wildlife species, turkey and bear, will continue to benefit from management favoring late-successional habitat and aging forest conditions

Water Availability and Use - Water is of good quality and available below 2,800 feet elevations There are at least six developed springs/water holes near trails or wildlife openings (old home sites) Water treatment is recommended for safe human consumption

Livestock Operations - None As alluded to in II A 1, the current open condition of some of the area around Cole Mountain is a result of past grazing

Timber - The currently designated SMA, consisting of 5,900 acres is classed as not suitable for timber production Outside the SMA but within the study area's boundary, there is a mixture of productive and noncommerical lands Based on data in the Continuous Inventory of Stand Conditions (CISC) data base that was used in the existing plan, there are approximately 2,200 acres of suitable forest land in the Mt Pleasant area This amounts to approximately 25 percent of the area's total acreage

There is little diversity in terms of timber age classes within the current Special Management Area (SMA) Younger age classes of timber are represented within the proposed boundary north of the SMA where evenaged timber management was practiced during the early 1980s The forest's condition is primarily mature poletimber and sawtimber with a few stands of immature and overmature timber also in the area

Minerals - Please reference Section II A 4 The area has no known potential for oil and/or gas recovery

Cultural Resources - There are no conflicts with current/future management needs in providing the necessary protection for these resources Some unique features of the historical past could be highlighted through a special interpretive effort compatible with wilderness

The Mount Pleasant area contains numerous prehistoric and some historic sites This area has been used by man for at least the last 8,000 years The South fork of the Piney River, George's Creek, and Buffalo River could have made a relatively easy access route into the area Trail via ridges similar to parts of the Appalachain Trail would have also been available This area offers some flat terrain, fairly abundant perennial waters and camping locations that would have served as seasonal hunt camps

Cole Mountain Fields, which lie essentially between Cole Mountain and Floyds Mountain, were once the location of a cow camp and perhaps, a hog camp The remains of an old structure known as the "hotel" can still be seen within the Fields Local farmers who drove their cattle to the fields for the summer stayed in the "hotel " The open fields and old hotel site offer an excellent opportunity for interpretation about one of the historically documented uses of the forest

Other types of historic sites found within this area include stone walls, house sites, and logging camps The logging camps have not been dated other than noting they occurred after prohibition was lifted in the 1930s

Authorized and Potential Land Uses - There are no existing special uses nor are any anticipated The Forest Service has a Memorandum of Understanding with the Natural Bridge Appalachian Trail Club and other volunteer agreements to maintain the interior trail system and open area on Cole Mountain

Management Considerations including Fire, Insects and Diseases, and Presence of Non-Federal Lands - Because of the protection from fire while under National Forest management, there is a considerable buildup of fuels Man-caused fires are uncommon The most recent fire was caused by lightning in April 1988 and burned 30 acres Mechanized attack of wildfire is practical and almost a necessity in the accessible portions of the area Suppression efforts would be very difficult on the steep, rocky, and more remote terrain, fires could become quite large under certain weather conditions

Potential spread of the Gypsy Moth is extremely high since oaks are the preferred host species Gypsy Moth surveys indicate that *populations in the area are increasing each year, and some defoliation and tree mortality can be expected in the near future*

There are no private in-holdings

What outputs are currently produced or could be produced in the future? *Dispersed recreation activities, primarily hunting,* fishing, viewing scenery, and hiking, should continue at a moderate level Water from the area will continue to be relied upon for *downstream recreation and domestic needs in Amherst County.*

Proposed timber management activities in stands outside the SMA but within the proposed boundary include 64 acres of regeneration using evenaged management and 26 acres using unevenaged management Because the sales have been postponed, timber values have not been calculated. Based on a visual map review, over one-half of the area outside the SMA, but within the proposed boundary, on north and west sides is suitable for timber management (S I 60+ and gentle slopes)

Current wildlife populations are not likely to fluctuate, except possibly in response to changes in habitat management practices or in response to activities on private land within the home range influence of a particular species

Is the area located such that the need for increased water production and/or additional onsite storage is so vital that installation or maintenance of improvements is an obvious and inevitable public necessity? NO

Would wilderness designation seriously restrict or prevent the application of wildlife management measures of considerable magnitude and importance? Ongoing timber management activities which provide timber to meet local wood demands also benefit some wildlife species Special Management Area (SMA) designation has administratively classed 5,900 acres under custodial management Some opportunities to create diversity of wildlife habitat would be lost on those acres suitable for timber management that lie between the SMA and proposed boundary Loss of opportunity to manage the open area would reduce favorable habitat for certain wildlife and plant communities Assuming that habitat manipulation is even possible on every acre, however, these lost opportunities would only involve an additional 3,000 acres This represents two percent of the 143,701 National Forest acres on the Pedlar Ranger District

Is it a highly mineralized area of such strategic or economic importance and extent that restrictions or controls due to wilderness designation would not be in the public interest? NO

Does the area contain natural phenomena of such unique or outstanding nature that general public access and special development to facilitate public enjoyment should be available? The Cole Mountain open areas represent a significant scenic resource on the Appalachian Trail This unique area would probably be lost if it could not be maintained under a wilderness designation Again, an adjustment of the western boundary to the east of the AT would remove this unique location from within the area's boundary

Is the land needed to meet clearly documented resource demands such as for timber, mineral production, or developed recreation? NO

Is the land committed through contractual agreements for use, purposes, or activities not in concert with wilderness requirements? NO

Need

Other Wildernesses·

How far is it to the closest existing wilderness? The 9,835 acre Saint Marys Wilderness is located approximately 10 miles to the north, the James River Face Wilderness of 8,903 acres is about 15 miles to the southwest

What level of use currently exists in near-by existing wilderness? What trends exist in the use of these areas? An estimated 6,000 recreation visitor days of use occurred in St Marys Wilderness in 1989 This is a significant amount of use and has resulted in serious impacts on the area's wilderness qualities and resources This use is not expected to decrease in the near future Campfire restrictions have been imposed in the St Marys Wilderness in an attempt to reduce the impacts from recreation use

Is the population in and around these areas increasing or decreasing? How quickly is it increasing or decreasing? The Mount Pleasant area is located in Amherst county, Virginia Between 1980 and 1990, Amherst's population increased at an average annual rate of 0 1 percent, from 29,122 to 29,360 people

In Nelson county to the north, the population grew at an average annual rate of 0 3 percent, from 12,204 to 12,550 during the same period of time. The most rapid growth over this period of time occured in Albemarle county to the west where the population increased from 55,783 to 63,544 at an average annual rate of 1 3 percent

Nonwilderness lands.

Are there opportunities for unconfined and primitive recreation experiences on nonwilderness areas in the vicinity? If so, where? Numerous acres of National Forest land are available for primitive recreation within a reasonable distance of the Mount Pleasant Area Also, these opportunities currently exist within the SMA boundary

Habitat·

Are there any biotic species in the area that are directly competing with increasing public use and development? While the inventory for Mt Pleasant has not been completed, high mountain elevations tend to harbor rare species, some of which may need or benefit from active management Wilderness desigantion might preclude or make such efforts more difficult

Could these needs be provided for through means other than wilderness designation? YES As noted, a majority of the area is already managed according to ROS criteria for semi-primitive, motorized and semi-primitve, nonmotorized recreation FDR 51 is currently managed as an ORV route The remainder of the area is managed for nonmotorized, dispersed recreation and to provide habitat for bear and turkey

Is there a need to provide a sanctuary for biotic species that cannot survive in less than primitive surroundings? The New England cottontail will probably disappear from this particular area if the shrubby, early successional areas become forested

George Washington National Forest
Lee Ranger District

NORTHERN MASSANUTTEN ROADLESS AREA

Scale

1:126,720

1/2 inch = 1 mile

Roadless Area

NORTHERN MASSANUTTEN ROADLESS AREA

I DESCRIPTION

Acres· approximately 9,410

Location and vicinity. Northern Massanutten is located on the Lee River Ranger District, George Washington National Forest Northern Massanutten contains the top of Massanutten Mountain, the eastern ridge surrounding Fort Valley, from Buzzard Rocks to just north of Kennedy Peak It is located in three counties of Virginia Warren, Page, and Shenandoah The northern end of the area is about 8 miles southwest of Front Royal, VA The southern end of the area is about 5 miles northwest of Luray, VA

Describe access to the area including roads and trails leading to the area Northern Massanutten can be accessed by Virginia Routes 613, 619, 684, 675, 678 and 717 and Forest Service Roads 236A and 406

Northern Massanutten is bisected by the Massanutten Mountain East (MME) trail Several sidetrails from public roads and trailhead parking lots tie into the MME trail

General description of the area's geography. Northern Massanutten lies along the main ridge of Massanutten Mountain, the eastern mountain of Fort Valley The Massanutten Mountain chain lies between the North and South Forks of the Shenandoah River and separates the main Shenandoah Valley on the North Fork from the Page valley on the South Fork This area is part of the Ridge and Valley Physiographic Province

General description of the area's topography Elevations range from approximately 1,000 feet on the northwestern boundary to more than 2,400 feet on the southern boundary Northern Massanutten includes the main ridge top and the steep upper sideslopes of the Massanutten Mountain The top of the mountain is a series of small peaks and saddles between the small peaks

General description of the area's vegetation, including the ecosystem type Northern Massanutten lies in the temperate, eastern deciduous forest zone of North America The vegetation is typical of mountain ridgetops within the Massanutten Mountains There are many rock outcroppings and cliffs Blockfields are common Vegetation on these sites includes bear oak, laurel, and mixed stands of gnarly chesnut oak and Table Mountain and pitch pine

Due to management intervention, natural fire has not played a role in Northern Massanutten for the past 50 to 60 years Vegetation is therefore of an uniform age with high fuel loads.

Key attractions, if any, including sensitive wildlife and scenic landmarks Most of the Buzzard Rocks, a vertical cliffline on the ridgetop, is within Northern Massanutten There is a historic Peregrine Falcon eyrie in the area of Buzzard Rocks

The 250-mile Big Blue Trail, originating on the Applachian Trail in Shenandoah Park and tying into the AT again in Pennsylvania, uses a section of the MME trail in the northern part of the area The Big Blue also uses the Veach Gap trail from a trailhead parking lot on Virginia Route 613 on the east side of the area to intersect the MME This trail is thought to be on the location of Morgan's Road which was built by General Daniel Morgan under orders of General George Washington to provide access into the Fort Valley There are some rockfills in this old wagon road that are 30 feet tall

Elizabeth Furnace Recreation Area is located on the north end of Northern Massanutten and provides a base for day loop hikes

II. INVENTORY

Human Influence

To what degree have humans and past and present human activity affected natural ecological processes and conditions? Northern Massanutten displays past evidence of man's presence Most of the area was cutover for charcoal to fuel Elizabeth Furnace and for tanbark There are a number of old roads and skidtrails dating from this period The majority of the forest stands are approximately 80 years old Northern Massanutten burned frequently prior to government acquisition

To what degree is the area natural or natural appearing and free from disturbance? Northern Massanutten appears to the average visitor as quite natural and free from disturbance by man The sight and sound of man's activities are evident from most of the area due to views of adjoining private land and the short distance from major State roads

If the area's ecological processes and/or natural appearance have been altered by past or present human activity, is the land regaining a natural, untrammeled appearance? Northern Massanutten has a natural and untrammeled appearance to the average visitor

Does the existing or attainable National Forest System ownership pattern, both surface and subsurface, ensure perpetuation of identified wilderness value? All of the surface resources in the Northern Massanutten Roadless Area are owned by the federal government

There are three tracts that lie partially or completely Northern Massanutten with outstanding or reserved minerals rights The mineral rights are reserved on 751 acres in a tract northwest of Bealers Ferry The mineral rights are outstanding on approximately 354 acres northwest of the Hazard Mill Canoe Camp The mineral rights are outstanding of approximately 108 acres on Little Crease Mountain

Is more than 15 percent of the area in non-native vegetation? NO

Improvements, Structures, and Nonconforming Uses

Are any of the following types of areas, features or nonconforming uses present? If so, where?

Areas with evidence of historic mining at least 50 years old (Do not include areas of significant current mineral activity)· There are some old open ore mines on the north end around Elizabeth Furnance There are also numerous charcoal hearths scattered throughout the area All are covered with leaf litter and vegetation and would not negatively impact the wilderness resource

Areas under current mineral lease that contain a "no surface occupancy" stipulation. NONE

Areas under current mineral lease where the leasee has not exercised development and occupancy rights. NONE

Recreation improvements such as occupancy spots or minor hunting or outfitter camps: There are no outfitter camps The only "occupancy spots" are primitive dispersed camping locations

Timber harvest areas where logging and prior road construction are or are not evident. Some of the old charcoal, tanbark, and log skidtrails and roads are evident to the keen observer Most are overgrown and do not detract from the primitive experience

Cultural treatments involving plantations or plantings· NONE

Private inholdings in the area· NONE

Dwellings on private inholdings NONE

Nonconforming structures and improvements. There are no nonconforming structures or improvements in Northern Massanutten, however there are several sites on private land very close to the boundary

Ground-return telephone lines: NONE

Watershed treatment areas. NONE

Roads: The old wagon road through Milford Gap, Forest Development Road (FDR) 560, is open and used by 4x4 vehicles Use is low and the road could be closed effectively if Northern Massanutten were to be designated as wilderness

Can existing nonconforming uses be effectively mitigated or terminated through removal or rapid natural deterioration? Yes, FDR 560 could be closed It would, however, remain visually evident for many years

Are improvements in the area being affected by the forces of nature rather than humans, and are they disappearing or muted? There are no improvements

If there are timber harvest areas, has less than 20 percent of the area been harvested within the past 10 years? YES

Does the area contain no more than 1/2 mile of improved system road for each 1,000 acres? YES

Are all existing roads under Forest Service jurisdiction? YES

III EVALUATION

Capability

Does the area contain the basic characteristics that make it suitable for wilderness designation without regard to its availability for or need as wilderness? Consider the following characteristics in analyzing the quality of the wilderness resource If these characteristics are determined to be important, describe and refer to them

Experiential benefits. Does that area provide the opportunity for solitude and serenity? Opportunities for true solitude and serenity are very limited due to the narrow width of the area and the adjoining development on private land At its widest point, Northern Massanutten is only one and one-half miles wide The average width of the area is approximately three-fourths of a mile The area's narrow width and its location along the ridge-top make it very difficult to manage from a wilderness standpoint

Challenge Does the area offer visitors the opportunity to experience adventure, excitement, challenge, initiative, or self-reliance Is access easy or difficult? Northern Massanutten is easily accessible by trails The area is too narrow to provide a sense of adventure and excitement and feeling of being self-reliant and using one's initiative

Outdoor Recreation Opportunities. What is the area's capability for providing primitive and unconfined types of recreation including

Camping - Northern Massanutten has many opportunities for primitive camping However, the sights and sounds of man would be prevalent throughout the area

Hunting - Northern Massanutten is popular for deer, bear, and turkey.

Fishing - NONE

Mountain Climbing - There has been some repelling done on Buzzard Rocks

Ski Touring - NONE

Canoeing - NONE

Boating - NONE

River Rafting - NONE

Backpacking - There is an excellent trail system in place

Hiking - There is an excellent trail system in place

Riding - Northern Massanutten is heavily used for horseback riding

Photography - Photography opportunities are typical of those available in the Massanutten range of the George Washington National Forest

Special Features:

What is the area's capability to provide outdoor education and scientific study, both formal and informal, in a manner compatible with wilderness? Northern Massanutten is close to large numbers of people and is easily accessed by road and trail As such, it could be used for educational purposes which might or might not be compatible with a wilderness designation

Is there an abundant and varied wildlife population? Northern Massanutten supports bear, deer, and turkey plus non-game species typical of the Massanuttens A historic peregrine falcon eyrie is located in the Buzzard Rocks area

Manageability

What are the characteristics of the surrounding area including ROS classification, adopted VQO, and present and planned uses? For the most part, the area is surrounded by private land although some National Forest lies along the east side of the area The surrounding area is predominately inventoried as roaded natural ROS although there are some semi-primitive non-motorized ROS areas The visual quality objective for the surrounding area is predominately partial retention although there is some retention and modification

Do boundary locations conflict with important existing or potential public uses outside the boundary that might result in demands to allow nonconforming structures and/or activities in the wilderness? None known There are several places along the boundary between private and National Forest that have private structures located against the property line

Is it possible to readily and accurately describe, establish, and recognize boundaries on the ground? The boundary of Northern Massanutten is composed of about 12 5 miles of private/government property line and about 10 6 miles within government ownership following contour lines The landlines are posted and can be recognized on the ground The remainder of the boundary, located primarily along contour lines, will be costly and time consuming to locate

Do boundaries, where possible, conform with terrain or other features that constitute a barrier to prohibited use? The steep nature of the side slopes effectively prevents non-conforming use in much of Northern Massanutten

Do boundaries, to the extent practicable, act as a shield to protect the wilderness environment inside the boundary from the sights and sounds of civilization? Because Northern Massanutten occupies a single, narrow ridge top in most places, the sights and sounds of civilization cannot be shielded

Do boundaries provide adequate opportunity for access and traveler transfer facilities? YES

Availability

Describe other (nonwilderness) resource demands and uses

Recreation - Northern Massanutten is used for hiking, horseback riding, mountainbike riding, and hunting It is heavily hunted for deer, turkey, and small game Bear hunting with dogs is increasing The MME and other trails within Northern Massanutten are used in the Old Dominion 100 Mile Endurance Trail Ride for horses and also runners as well as several other horse endurance events on an annual basis The Old Dominion 100 Miler is recognized as a world class event.

Information on Wildlife Species, Populations, and Management Needs Deer and bear populations are average for the Massanuttens Terrain and vegetation do not favor turkey within the area proper The adjoining National Forest land on the eastside of the area is favorable turkey habitat

Water Availability and Use - NONE

Livestock Operations - NONE

Timber - According to stand records, there is very little acreage within Northern Massanutten that is suitable to timber production

Minerals - There are no active federal mineral leases and no anticipated demand for federal minerals Although mineral potential is considered low, private mineral owners may seek to exercise their development rights

cultural resources - There are few archaelogical sites expected to be within this area due to its location along the top of a main mountain ridge Morgan's Road was discussed previously under **Key Attractions** There was a Civil War signal station at Milford Gap This site has never been explored

Authorized and Potential Land Uses - There are no permanent occupancy type uses authorized now nor are any anticipated in the future There are authorized recreation events such as the Old Dominion 100 Miler currently authorized

Management Considerations Including Fire, Insects and Diseases, and Presence of Non-Federal Lands - Gypsy moth has defoilated Northern Massanutten for several years now and will probably do so for another 1 to 2 years before their population crashes

What outputs are currently produced or could be produced in the future? Recreation activities including hunting, hiking, and riding are the primary outputs of Northern Massanutten Northern Massanutten presently serves as good bear habitat which could be enhanced through habitat manipulation such as creating permanent openings and waterholes and prescribed burning

Is the area located such that the need for increased water production and/or additional onsite storage is so vital that installation or maintenance of improvements is an obvious and inevitable public necessity? NO

Would wilderness designation seriously restrict or prevent the application of wildlife and/or threatened and endangered plant or animal management measures of considerable magnitude and importance? NO

Is it a highly mineralized area of such strategic or economic importance and extent that restrictions or controls due to wilderness designation would not be in the public interest? NO

Does the area contain natural phenomena of such unique or outstanding nature that general public access and special development to facilitate public enjoyment should be available? NO

Is the land needed to meet clearly documented resource demands such as for timber, mineral production, or developed recreation? NO

Is the land committed through contractual agreements for use, purposes, or activities not in concert with wilderness requirements? NO

Need

Other Wildernesses:

How far is it to the closest existing wilderness? There are 82,260 acres of wilderness in Shenandoah National Park The closest of these existing wilderness areas is about 5 miles to the east of Northern Massanutten

What level of use currently exists in near-by existing wilderness? What trends exist in the use of these areas? The wilderness areas in the Shenandoah National Park recieve high use and the trend is steady since 1981 according to SNP officials

Is the population in and around these areas increasing or decreasing? How quickly is it increasing or decreasing? The population is increasing moderately in the local area The regional area, which includes the D C metro area, is increasing as a moderate to high rate Much of the recreation use in Northern Massanutten orginates from the Washington, D C area

Studies of visitors to the St. Marys wilderness on the Pedlar Ranger District have indicated that the visitors often travel up to 100 miles to get to the area In light of this, it is useful to look at the population of the state of Virginia and West Virginia Between 1980 and 1990, the population of the State of Virginia increased at an annual rate of 1 4 percent while the population for the state of West Virginia decreased at an annual rate of 0 4 percent

Nonwilderness lands:

Are there opportunities for unconfined and primitive recreation experiences on nonwilderness areas in the vicinity? If so, where? There is many acres of National Forest that join Northern Massanutten on the northwest and on the south within the Massanutten Mountain range Shenandoah National Park lies just to the east of this area The entire west side of the Lee District lies just across the Shenandoah Valley

Habitat:

Are there any biotic species in the area that are directly competing with increasing public use and development? A survey for rare flora and fauna in Northern Massanutten has not been completed At this time, there are no known biotic species in Northern Massanutten that are directly competing with increasing public use and development

Could their needs be provided for through means other than wilderness designation? NOT APPLICABLE

Is there a need to provide a sanctuary for biotic species that cannot survive in less than primitive surroundings? There is not a need to provide a sanctuary for biotic species that cannot survive in less than primitive surroundings

George Washington National Forest
Dry River Ranger District

OAK KNOB ROADLESS AREA

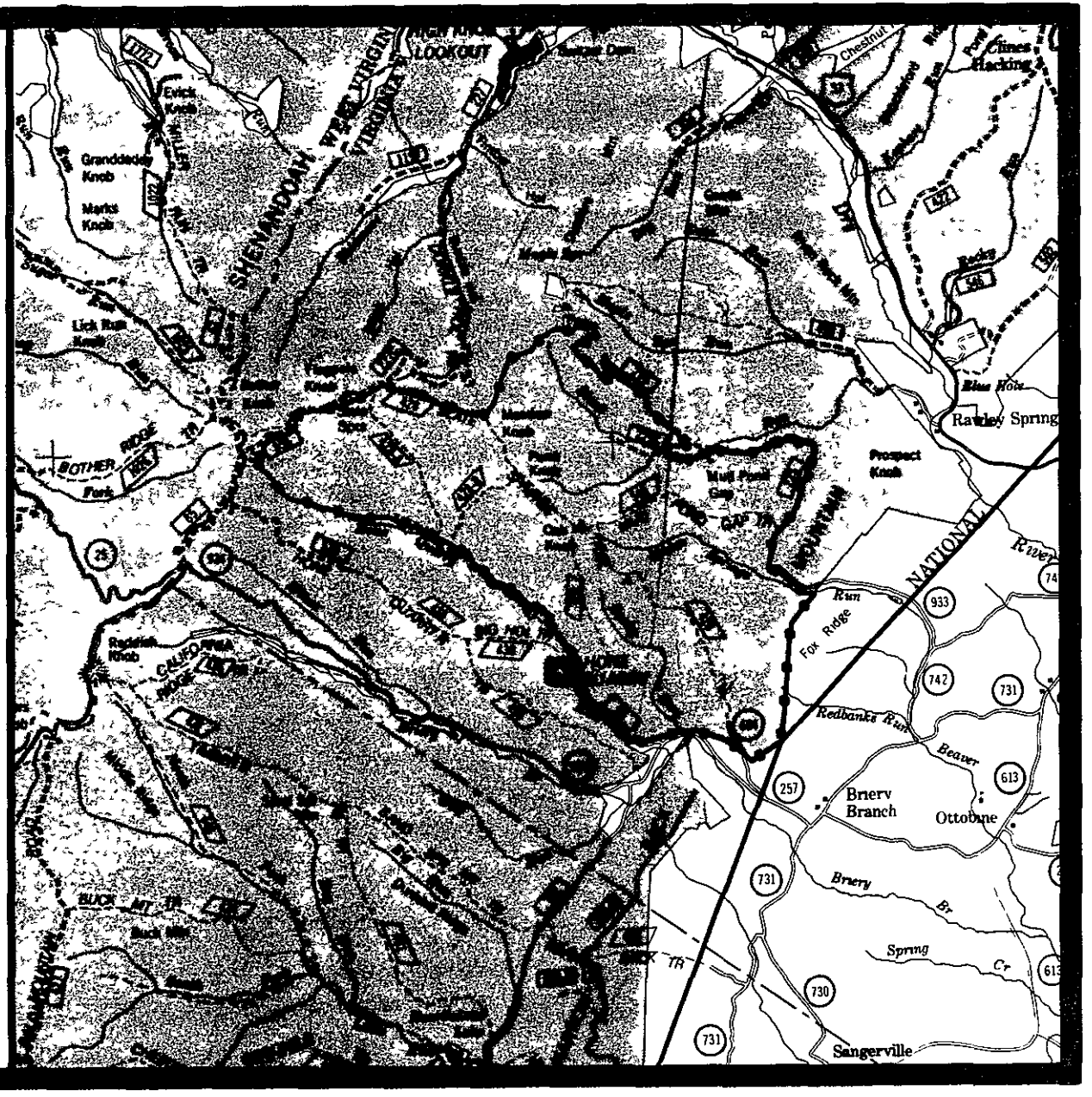
Scale

1:126,720

1/2 inch = 1 mile

N

Roadless Area



OAK KNOB ROADLESS AREA

Acres· approximately 10,866

Location and vicinity. The area is located on the Dry River Ranger District, George Washington National Forest It is located in Rockingham County, Virginia The eastern boundary adjoins private land and Forest Road 225 The western boundary and part of the northern boundary follows forest development roads (FDR) 85A and 225B The remainder of the northern boundary follows FDR 225 The southern boundary is FDR 62 and the Hone Quarry drainage bottom up to the top of Shenandoah Mountain

Describe access to the area including roads and trails leading to the area The boundary can be accessed by the following roads State Road 257 and Forest Roads 62, 85A, 225, 225B and 225C These roads are open for public use all year

Approximately 2 miles of FDR 62 above Hone Quarry Lake is to be reconstructed to provide improved motorized access to the Hone Quarry drainage Forest Road 85A is scheduled to be reconstructed in fiscal year (FY) 1991 to provide improved motorized access for sight-seeing and dispersed camping in the Flagpole Knob area Forest Road 225 was reconstructed in FY 1990 to provide improved access for dispersed recreation users of the Union Springs drainage and for private landowners with cabins near Maple Springs

The following Forest Service trails provide access FDT 544, 544, 428, 428A, 428B, 429 There are a number of additional trails and old roads within the area that are not listed on the forest's official transportation system

General description of the area's geography The area lies within the Ridge and Valley Physiographic Province of Virginia It contains mountain ridges and associated knobs and parallel drainages in a contorted arrangement Spur ridges and associated small drainages lead off from the major ridges and knobs The larger knobs are Pond Knob, Oak Knob, and Mud Pond Gap Meadow Knob and Flag Pole Knobs are very popular dispersed recreation areas located just outside the boundary

General description of the area's topography Elevations range from about 1,700 feet in the Union Springs drainage to 4,302 feet on Flag Pole Knob in on the western portion

General description of the area's vegetation, including the ecosystem type The area is forested with mixed eastern hardwoods The north and east facing slopes and other moist sites support oaks, hickories, and white pine The poorest sites, on ridge tops and southern and western exposures contain oaks, and yellow and white pines in mixture The deepest drainages, where the sites are cool and moist, contain cove hardwoods including birch, maple, yellow poplar and other associated species

Understory vegetation varies with aspect and moisture regime Riparian vegetation exists along perennial and larger intermittent streams The driest sites contain fetterbush, scrub oaks, and yellow and white pine regeneration Intermediate sites contain pine and hardwood regeneration, understory tree species such as dogwood and black gum, laurel, and sparse amounts of herbaceous plants

Key attractions, if any, including sensitive wildlife and scenic landmarks. There are no significant landforms, or other prominant features Much of the area is steep and rugged Wildlife species in the area include black bear and wild turkey which thrive in remote areas free from disturbance

Hone Quarry Dam, a 20-acre flood control impoundment is located just outside the boundary on the southern side of the area This lake is a stocked trout fishery

II INVENTORY

Human Influence

To what degree have humans and past and present human activity affected natural ecological processes and conditions? Except for the deeper, most rugged drainages, and the dry sites on ridges which contain small timber, most of the area was cut over in the late 1800s and early 1900s Most of the forest is now about 90 years old The area burned frequently prior to government acquisition

During the 1950s and 1960s most of the highest quality timber in the area was harvested Much of the remaining hardwood sawtimber is less than high quality There are about four white pine plantations comprising an estimated 150 acres in the Mud Pond area Also, in the Mud Pond area along FDR 225, three fuelwood sales, comprising about 40 acres each were harvested between 1982 and 1984 There are about 20 grassy, man-made wildlife clearings and several man-made wildlife waterholes within the area

These activities have not and will not affect natural ecological processes and conditions in the area to a significant degree

To what degree is the area natural or natural appearing and free from disturbance? Except for the recent timber harvest areas and wildlife improvements the area appears to be in a natural condition

Vehicles traveling roads along the boundary can be heard in most parts of the area Noise from residences, small farms and poultry houses can be heard in the extreme eastern portion

If the area's ecological processes and/or natural appearance have been altered by past or present human activity, is the land regaining a natural, untrammeled appearance? Except for the recent timber harvest, the area appears natural to the average visitor Those areas that were recently harvested will eventually regain a natural and untrammeled appearance

Does the existing or attainable National Forest System ownership pattern, both surface and subsurface, ensure perpetuation of identified wilderness value? Mineral rights on one tract (S-16) are reserved in perpetuity It is unlikely that valuable subsurface mineral deposits exist However, there is a strong possibility that the area has shale and gravel deposits that could be commercially developed

Private land on the eastern side of the area has been developed and supports residences and farms Adjacent private lands often present a problem in that they provide easy access for illegal motorized use of the wilderness Residential development up to the area's boundary can also have a serious impact on the wilderness experience from a visual and noise standpoint

Is more than 15 percent of the area in non-native vegetation? NO

<u>Improvements, Structures, and Nonconforming Uses</u>

Are any of the following types of areas, features or nonconforming uses present? If so, where?

Areas with evidence of historic mining at least 50 years old (Do not include areas of significant current mineral activity). NO

Areas under current mineral lease that contain a "no surface occupancy" stipulation There is one valid lease currently in effect within the area This is lease ES35598 There is nothing in the lease to prohibit surface occupancy

Areas under current mineral lease where the leasee has not exercised development and occupancy rights: There is one valid lease (ES35598) currently in effect within the area The leasee has not exercised development or occupancy rights

Recreation improvements such as occupancy spots or minor hunting or outfitter camps. There are primitive, dispersed camping *sites scattered throughout the area There are some signs and markers located along trails within the area*

Timber harvest areas where logging and prior road construction are or are not evident: There are several timber harvest cutting units which were harvested in the 1960s and 1980s These units have temporary roads and skid trails associated with them The harvest areas and associated roads and skid trails are visually evident

Cultural treatments involving plantations or plantings· A total of three areas, totalling approximately 150 acres, were planted with white pine about 25 years ago

Private inholdings in the area: NONE There are three private tracts in the Maple Springs area located just outside the boundary of the area to the north These tracts all contain dwellings

Dwellings on private inholdings. NONE

Nonconforming structures and improvements NONE

Ground-return telephone lines. NONE

Watershed treatment areas. NONE

Roads: Forest Development Road (FDR) 225C, a D-level road used for administrative purposes, enters the northern portion of the area off FDR 225 FDR 225C continues up Black Run after 225 swings around a parcel of private land and ascends the ridge towards Maple *Springs*

There are several miles of old roads in the area that are not on the Forest's transportation system Many of these roads are popular ORV routes and are frequently, albiet illegally, traveled

Can existing nonconforming uses be effectively mitigated or terminated through removal or rapid natural deterioration? It will be very difficult to eliminate the illegal OHV and ATV use in the area Illegal access often originates on adjacent private lands, making control even more difficult

Are improvements in the area being affected by the forces of nature rather than humans, and are they disappearing or muted? Recently harvested areas should receive cultural treatments with chainsaws to ensure adequate regeneration Wildlife clearings are mowed every other year Wildlife ponds receive maintenance to keep them functioning All of the above improvements are visually evident If left to the forces of nature, they would become muted and disappear over time

III EVALUATION

Capability

Does the area contain the basic characteristics that make it suitable for wilderness designation without regard to its availability for or need as wilderness? Consider the following characteristics in analyzing the quality of the wilderness resource. If these characteristics are determined to be important, describe and refer to them

Experiential benefits Does that area provide the opportunity for solitude and serenity? Due to the relatively small size of the area, typical of most eastern wildernesses, and the presence of residential developments on adjacent private lands, opportunities for solitude and serenity are relatively limited

Challenge Does the area offer visitors the opportunity to experience adventure, excitement, challenge, initiative, or self-reliance Is access easy or difficult? Access to the area is provided from Forest Service system roads that border the area and system and other trails in the area The area can be easily accessed None of the area is over 5 or 6 miles from a place of permanent human habitation

The area offers moderate opportunities for adventure, exictement and challange

Outdoor Recreation Opportunities What is the area's capability for providing primitive and unconfined types of recreation including

Camping - There are numerous opportunities for primitive camping

Hunting - The area is currently very popular for deer, bear, wild turkey and small game hunting

Fishing - There are native trout populations in Black Run on the northern border of the area and Rocky Run which penetrates the southeastern portion of the area

Mountain Climbing - There are no known sites suitable for this activity

Ski Touring - Snowfall in the George Washington National Forest is typically sporadic and insufficient to support cross-country skiing on a regular basis Limited skiing does take place after large snowfalls but favorable conditions do not usually last long

Canoeing - There are no streams or rivers large enough to support this activity

Boating - There are no streams or rivers large enough to support this activity

River Rafting - There are no streams or rivers large enough to support this activity

Backpacking - The area offers excellent opportunities for backpacking Trips lasting one or two nights are possible

Hiking - The area contains an excellent trail system

Riding - Horseback riding is becoming an increasingly popular activity in the area The current trail system is suitable for day trips as well as one-night trips

Photography - The area offers photographic opportunities typical of the George Washington National Forest

Special Features.

What is the area's capability to provide outdoor education and scientific study, both formal and informal, in a manner compatible with wilderness? The area could support both formal and informal outdoor education and scientific studies

Is there an abundant and varied wildlife population? The area supports black bear, white-tailed deer, wild turkey, squirrels and a number of other game and non-game species typical of the Southern Appalachians

The area is also inhabited by the Cow Knob salamander in the higher elevations Red crossbills may inhabit yellow pine areas Other rare plant and animal species may be present but an inventory has not been completed

Manageability·

What are the characteristics of the surrounding area including ROS classification, adopted VQO, and present and planned uses? The land surrounding FDR 225 from where it enters the forest to where it crosses Black Run has an assigned visual quality objective (VQO) of retention Retention is also the assigned VQO for lands surrounding FDR 62 up to Hone Quarry lake Outside of these two corridors, the majority of lands surrounding the Oak Knob area have an assigned VQO of modification

Do boundary locations conflict with important existing or potential public uses outside the boundary that might result in demands to allow nonconforming structures and/or activities in the wilderness? There are no known potential problems with the boundary locations The eastern boundary borders wooded private land At the present time no requests for permits, authorizations, or special uses have been received.

The Hone Quarry flood control dam/impoundment borders the area Public water supply is becoming an important issue in Rockingham County as growth continues The county has recently considered the possibility of enlarging some of the existing flood control dams/impoundments throughout the county to increase muncipal water supplies. The Hone Quarry impoundment has not been considered to date, but there is a possibility that in the future, Rockingham County may look at this type of site to expand the munincipal water supply

Is it possible to readily and accurately describe, establish, and recognize boundaries on the ground? Generally the boundaries could be readily and accurately established on the ground Most of the area's boundaries adjoin private land and/or roads

Do boundaries, where possible, conform with terrain or other features that constitute a barrier to prohibited use? Boundaries follow roads and non-federal land boundaries There are no natural barriers to prohibited uses

Do boundaries, to the extent practicable, act as a shield to protect the wilderness environment inside the boundary from the sights and sounds of civilization? Due to the size of the area and its closeness to developed roads and private land, the sights and sounds of human activity will be fairly common

Do boundaries provide adequate opportunity for access and traveler transfer facilities? YES

Availability:

Describe other (nonwilderness) resource demands and uses

Recreation - The interior region is used for hiking, hunting, dispersed camping, horesback riding, mountain bike riding, stream fishing, berry picking, sight seeing, and ORV and ATV travel

Information on Wildlife Species, Populations, and Management Needs - The area contains game and non-game species commonly found in the Southern Appalachians

Water Availability and Use - Several streams have sufficient water year around to support a native trout fishery In the higher elevations, seeps and scattered springs are the only water sources All drainages contain either perennial or intermitent streams

Water in the streams is not safe for human consumption since it may contain various aquatic parasites that cause distress to humans Water taken directly from springs and seeps may not contain these aquatic parasites

Livestock Operations - NONE

Timber - The area contains stands of pine pulpwood and low quality hardwoods suitable for fuelwood Demand exists for both products Some of the drainages contain stands of better quality hardwoods which are also in demand Timber sales are currently planned within the next five years in the Union Springs and the Hone Quarry drainages About 200 acres are planned for harvest

Minerals - The mineral potential of the area is not fully known There is no indication that the area has potential for mineral development To date, little interest has been shown for any activity other than leasing for oil and gas exploration

Cultural Resources - The area has limited potential for archaeological sites

Authorized and Potential Land Uses - There is a valid oil and gas lease within the area

Management Considerations Including Fire, Insects and Diseases, and Presence of Non-Federal Lands - The area will probably be defoliated by the gypsy moth to varying degrees within the next 5 years The Southern pine beetle is currently endemic, but populations are building yearly

Wilderness designation could make wildfire suppression more difficult, as mechanized equipment would not be allowed in the wilderness under most circumstances Due to an active suppression program since government acquisition, fuel loadings are relatively high in the area This could result in intense fires, making suppression even more difficult Substantial mortality occurs resulting from the gypsy moth or Southern pine beetle would further increase fuel loadings

What outputs are currently produced or could be produced in the future? The area provides good opportunities for hunting, especially for deer, bear, turkey, squirrel and other small game Many popular game species would benefit from habitat manipulation to provide openings in the canopy and stimulate understory growth

The area contains good quality hardwood sawtimber, pine pulpwood and hardwood fuelwood Local demand for these products exists A commercial timber sale of about 200 acres is scheduled in the Union Springs drainage for fiscal year 1993 A 200 acre sale is planned for fiscal year 1994 in the Hone Quarry Drainage

Is the area located such that the need for increased water production and/or additional onsite storage is so vital that installation or maintenance of improvements is an obvious and inevitable public necessity? No, the area is not located such that it is critical, at this time, to providing for the water needs of the area If future demand for water begins to exceed supply, the Hone Quarry impoundment which adjoins the boundary could be enlarged to provide for the needs of Rockingham County This would adversely impact the area While impoundments on Blacks Run or Union Springs are possible, they could be located on private or municipal lands

Would wilderness designation seriously restrict or prevent the application of wildlife and/or threatened and endangered plant or animal management measures of considerable magnitude and importance? No, but many wildlife and plant species in the area would benefit from habitat manipulation using methods such as timber harvest, prescribed burning or mechanical methods

Is it a highly mineralized area of such strategic or economic importance and extent that restrictions or controls due to wilderness designation would not be in the public interest? NO

Does the area contain natural phenomena of such unique or outstanding nature that general public access and special development to facilitate public enjoyment should be available? NO

Is the land needed to meet clearly documented resource demands such as for timber, mineral production, or developed recreation? NO

Is the land committed through contractual agreements for use, purposes, or activities not in concert with wilderness requirements? There is a valid oil or gas lease currently in effect within the area

<u>Need</u>

Other Wildernesses

How far is it to the closest existing wilderness? Ramseys Draft is approximately 11 miles from the southern boundary of the Oak Knob area

What level of use currently exists in near-by existing wilderness? What trends exist in the use of these areas? According to Recreation Information Management (RIM) use records from 1989, there were a total of 3,100 recreation visitor days of use in Ramseys Draft Trends indicate a steady increase in use of the area Impacts from recreation use are beginning to appear along the Ramseys Draft creek and close to the Mountain House recreation area

Is the population in and around these areas increasing or decreasing? How quickly is it increasing or decreasing? The Oak Knob area is located in Rockingham County, Virginia Between 1989 and 1990, the county's population increased from 57,038 to 67,133 at an annual rate of 0 7 percent In Pendleton county, West Virginia, located immediately to the west, the population increased from 7,910 to 7,997 over the same period of time

Recent surveys of users of the St Marys wilderness indicate that many travel a significant distance, up to 100 miles, to visit the area *In light of this, it is useful to look at the population of the states of Virginia and West Virginia Between 1980 and 1990, Virginia's* population increased at an annual rate of 1 4 percent while West Virginia's inmcreased at an annual rate of 0 4 percent The rate of increase in Virginia's population is significant and could reusit in equally significant demands on the wilderness resource

Nonwilderness lands:

Are there opportunities for unconfined and primitive recreation experiences on nonwilderness areas in the vicinity? If so, where? There are many opportunities for primitive recreation experiences on nonwilderness lands in the vicinity

Habitat:

Are there any biotic species in the area that are directly competing with increasing public use and development? Black bear and wild turkey populations in the area directly compete with increasing public use and development

The demand for motorized recreation and developed recreation sites offering an increased variety of activities is increasing The demand for permitted special use events is also increasing

With the increased interest in all types of activities on the Forest, the biotic species requiring solitude become increasingly vulnerable to disturbance from humans

Could their needs be provided for through means other than wilderness designation? Yes, the needs of unique, sensitive, threatened and/or endangered species could be met through the establishment of Research Natural Areas, Special Management *Areas, or by allocating the area to other management prescriptions that would afford protection for these species*

The George Washington National Forest is cooperating with the U S. Fish and Wildlife Service in developing a conservation strategy for the Cow Knob salamander in the form of a pre-listing recovery plan This plan will specify standards by which the area will be managed to ensure the viability and long conservation of this species

Is there a need to provide a sanctuary for biotic species that cannot survive in less than primitive surroundings? This is unknown at this time Studies are being conducted at this time to determine the specific habitat needs of many of these species

George Washington National Forest
James River Ranger District

OLIVER MOUNTAIN ROADLESS AREA

Scale

1:126,720
1/2 inch = 1 mile

Roadless Area

OLIVER MOUNTAIN ROADLESS AREA

I. DESCRIPTION

Acres. Approximately 13,081

Location and Vicinity Oliver Mountain Roadless Area is located on the James River Ranger District of the George Washington National Forest approximately 10 miles northwest of Covington, Virginia Oliver Mountain is in the northwest portion of Alleghany County, Virginia

Access, Including Roads And Trails Leading To The Area: Route 600 forms the east boundary, State Route 661 forms the south and west boundary, while the Virginia, West Virginia state lines form part of the northwest boundary The northern boundary is the NF property line which runs parallel with the Alleghany/Bath County line

The Oliver Mountain trail leads through parts of the area from Fortney Branch to Rucker Gap Also the Jackson Trail, Spring Branch Trail and woods road are located in the area State Route 661 borders National Forest in several places State Route 600 borders National Forest near Lake Moomaw FDR 192 goes into the area for approximately 3 2 miles and is open year round to the public Hughes Draft Road goes through the north portion of the area The Hughes Draft Road takes off from Ruckers Gap and goes to Lake Moomaw

General Description of the Area Geography· The Oliver Mountain Roadless Area comprises most of Oliver Mountain Oliver Mountain is bordered on the west by Ogles Creek and State Route 661, on the south by STate Route 661 and Johnson Creek, on the *east by State Route 600, Cove Branch, and Dry Branch, and on the north and northwest by Hughes Draft and Lake Moomaw*

General Description of the Area Topography. Elevation ranges from 1430 feet to 3565 feet above sea level Johnson Creek, Spring Branch and Hughes Draft are the major drainages Hughes Draft flows into Lake Moomaw Spring Branch is a tributary of Johnson Creek which flows into Ogles Creek

General Description of the Area Vegetation, Including the Ecosystem: Oliver Mountain contains eastern upland hardwoods, mainly Oaks, Pitch Pine, Table Mountain Pine, and Virginia Pine are found on the drier aspects Eastern White Pine can be found throughout the area and Hemlock on the moist sites

Key Attractions, if any, Including, Sensitive Wildlife and Scenic Landmarks. There are no specific key attractions within Oliver Mountain. Heading northwest on State Route 661, a peak of 2562 feet above sea level stands out

II. INVENTORY

Human Influence

To what degree have human, past and present activities affected natural ecological processes and conditions? Present and past activities have had little effect on the ecological processes and conditions of Oliver Mountain There is some old growth in this area There is also some old sawmill sites located in the area, where cutting took place in the early 1900's

To what degree is the area natural appearing and free from disturbance? On National Forest land the only disturbances are cutting on the Bradley Tract before purchase by the Forest Service in the early 1970s, a firewood sale near Spring Branch in 1978-79, *and the construction of FDR 192 in the mid 1980s For the most part Oliver Mountain during Forest Service ownership, generally* appears natural and free from disturbances There is some noise from vehicles using State Route 661 Before Forest Service ownership, timber harvesting took place in easy accessible areas

If the area ecological processes and/or natural appearances have been altered by past or present human activity, is the land regaining a natural, untrammeled appearance? Approximately 90-95% of Oliver Mountain is regaining it natural untrammeled appearance The only non-native vegetation is some grass sowed on old roads for erosion control There is also several blocked old woods roads in the area

Does the existing or attainable National Forest System ownership pattern, both surface and subsurface, ensure perpetuation of identified wilderness value? Both the surface and subsurface resources are owned by the National Forest System Amoco has gas leases

Is more than 15 percent of the area in non-native vegetation? NO

Improvements, Structures, and Nonconforming Uses

Are any of the following types of areas, features or nonconforming uses present? If so, where?

Areas with evidence of historic mining at least 50 years old (Do not include areas of significant current mineral activity) NONE

Areas under current mineral lease that contain a "No surface occupancy" stipulation: NONE

Areas under current mineral lease where the leasee has not exercised development and occupancy rights· NOT APPLICABLE

Recreation improvements such as occupancy spots or minor hunting or outfitter camps Spring Branch and Hughes Draft have some primitive hunt camps

Timber harvest areas where logging and prior road construction are or are not evident The Bradley Tract off State Route 661 was harvested in early 70s before purchase by the U S Forest Service TSI was completed on the Bradley Tract in 1975 Some small firewood sales occurred in 1978-79 along Spring Branch, and FDR 192 was constructed around 1985 The old logging road has been waterbarred, seeded and closed

Cultural treatments involving plantations or plantings: NONE

Private inholdings in the area. NONE

Dwellings on private inholdings: NONE

Nonconforming structures and improvements NONE

Ground-return telephone lines. NONE

Watershed treatment areas: NONE

Roads· FDR 192, Hughes Creek Road

Can existing nonconforming uses be effectively mitigated or terminated through removal or rapid natural deterioration Not Applicable

Are improvements in the area being affected by the forces of nature rather than humans, and are they disappearing or muted? The stands that were harvested during the 1970s are being muted by the forces of nature

III EVALUATION

Capability

Does the area contain the basic characteristics that make it suitable for wilderness designation without regard to its availiability for or need as wilderness? Consider the following characteristics in analyzing the quality of the wilderness resource If these characteristics are determined to be important, describe and refer to them

Experiential benefits. Does the area provide the opportunity for solitude and serenity? Due to traffic noise from Virginia Routes 600 and 661, opportunities for solitude are limited Most of the traffic is local cars and log trucks

Challenge. Does the area offer visitors the opportunity to experience adventure, excitement, challenge, initiative, or self-reliance Is access easy or difficult? Due to steep terrain and limited access, hiking in Oliver Mountain would be a challenge To go across country, the Oliver Mountain Trail is moderate to easy

Outdoor Recreation Opportunities What is the area capability for providing primitive and unconfined types of recreation including.

Camping - Oliver Mountain offers limited camping opportunities in Spring Branch, Hughes Draft and Hughes Creek

Hunting - Oliver Mountain has good opportunities for hunting with some limitations caused by lack of access and steep terrain in places Most hunting occurs up Spring Branch and Hughes Draft

Fishing - NONE

Mountain Climbing - There are very few opportunities for mountain climbing on Oliver Mountain

Ski Touring - NONE

Canoeing - NONE

Boating - NONE

River Rafting - NONE

Backpacking - Oliver Mountain offers good opportunities for backpacking Use Oliver Mountain Trail to go from Lake Moomaw to Sherwood Recreation Area in West Virginia - 26 miles

Hiking - Oliver Mountain offers good opportunities for hiking

Riding - Oliver Mountain has very limited opportunities for horseback riding along existing trails

Photography - There are good opportunities for photography on FDR 192, overlooking Lake Moomaw

Special Features:

What is the area capability to provide outdoor education and scientific study, both formal and informal, in a manner compatible with wilderness? UNKNOWN

Is there an abundant and varied wildlife population? Oliver Mountain supports bear, deer, squirrel, grouse, raccoon and turkey plus non-game species typical of the locale

Manageability:

What are the characteristics of the surrounding area including ROS classification, adopted VQO, and present and planned uses? The surrounding area is inventoried as either roaded natural or semi-primitive non-motorized ROS The visual quality objective for the surrounding area is generally modification and partial retention Most of the surrounding area is privately owned Presently used for dispersed recreation (hunting mostly) by the public

Do boundary locations conflict with important existing or potential public uses outside the boundary that might result in demands to allow nonconforming structures and/or activities in the wilderness? NONE KNOWN

Do boundaries, where possible, conform with terrain or other features that constitute a barrier to prohibited use? NO

Do boundaries, to the extent practicable, act as a shield to protect the wilderness environment inside the boundary from the sights and sounds of civilization? NO

Do boundaries provide adequate opportunity for access and traveler transfer facilities? The boundary limits access to the eastern portion of Oliver Mountain

Is it possible to readily and accurately describe, establish, and recognize boundaries on the ground? Yes Most of the boundary *is comprised of painted landlines The remainder of the boundary follows roads and terrain features*

Do boundaries, where possible, conform with terrain or other features that constitute a barrier to prohibited use? NO

Do boundaries, to the extent practicable, act as a shield to protect the wilderness environment inside the boundary from the sights and sounds of civilization? NO

Do boundaries provide adequate opportunity for access and traveler transfer facilities? The boundary limits access to the eastern portion of Oliver Mountain

Availability

Describe other (nonwilderness) resource demands and uses What current uses exist?

Recreation. Oliver Mountain is used for hiking, some horseback riding, and hunting The amount of use is unknown Hunting peaks during deer season Hiking is moderate There is some primitive camping in Spring Branch, Hughes Draft and along the Jackson and Oliver Mountain Trail

Information on wildlife species, populations, and management needs: Deer, turkey, and bear populations are normal for the ridge and valley province There is some grouse, grey squirrels, raccoons and reports of some fox squirrels being seen in the area

Water availability and use. NONE to very little Hughes Draft, Spring Branch, and Hickory Lick are the biggest water sources

Livestock operations: NONE

Timber. According to stand records, Oliver Mountain includes acres of land that are suitable for timber production according to species and SI. Especially on the Bradley Tract, Spring Branch and Hughes Draft

Minerals· There is not anticipated demand for leasing of federal minerals

Cultural Resources· NONE KNOWN

Authorized and potential land uses. NONE

Management considerations including fire, insects and diseases, and presence of non-federal lands: In about 5-7 years, the gypsy moth will be causing some defoliation and mortality in Oliver Mountain Public access is severely limited by private land

What outputs are currently produced or could be produced in the future? NONE

Is the area located such that the need for increased water production and/or additional onsite storage is so vital that installation or maintenance of improvements is an obvious and inevitable public necessity? NO

Would wilderness designation seriously restrict or prevent the application of wildlife and/or threatened and endangered plant or animal management measures of considerable magnitude and importance? NO

Is it a highly mineralized area of such strategic or economic importance and extent that restrictions or controls due to wilderness designation would not be in the public interest? NO

Does the area contain natural phenomena of such unique or outstanding nature that general public access and special development to facilitate public enjoyment should be available? NO

Is the land needed to meet clearly documented resource demands such as for timber, mineral production, or developed recreation? Northern portion, just south of Lake Moomaw, has potential for development of system of trails, providing for loop trails not found elsewhere on the district It is also suitable for horseback use as well

Is the land committed through contractual agreements for use, purposes, or activities not in concert with wilderness requirements? NO

Need

Other Wildernesses:

How far is it to the closest existing wilderness? The Rough Mountain Wilderness lies approximately 27 miles east

What level of use currently exists in near-by existing wilderness? What trends exist in the use of these areas? Rough Mountain and Rich Hole Wildernesses recorded only 3,800 visitor days of use in 1989 This is a relatively low level use Most use takes place during big game hunting season

Is the population in and around these areas increasing or decreasing? How quickly is it increasing or decreasing? Oliver Mountain is located in Alleghany County The population decreased between 1980 and 1990

Studies of visitors to the St Marys Wilderness on the Pedlar Ranger District have indicated that the visitors often travel up to 100 miles to get to the area In light of this, it is useful to look at the population in the states of Virginia and West Virginia Between 1980 and 1990, the population of the State of Virginia increased at an annual rate of 1 4 percent while the population for the state of West Virginia decreased at an annual rate of 0 4 percent Alleghany County borders on West Virginia

Nonwilderness Lands.

Are there opportunities for unconfined and primitive recreation experiences on nonwilderness areas in the vicinity? If so, where? There are many acres of National Forest on Brushy Mountain and Little Mountain

Habitat:

Are there any biotic species in the area that are directly competing with increasing public use and development? A survey for rare flora and fauna in Oliver Mountain has not been completed At this time, there are no known biotic species in Oliver Mountain that are directly competing with increasing public use and development

Could their needs be provided for through means other than wilderness designation? NOT APPLICABLE

Is there a need to provide a sanctuary for biotic species that cannot survive in less that primitive surroundings? There is not a need to provide a sanctuary for biotic species that cannot survive in less than primitive surroundings

Do boundaries provide adequate opportunity for access and traveler transfer facilities? The boundary limits access to the eastern portion of Oliver Mountain

Availability

Describe other (nonwilderness) resource demands and uses. What current uses exist?

Recreation: Oliver Mountain is used for hiking, limited horseback riding, and hunting The amount of use is unknown Hunting peaks during deer season Hiking is moderate

Information on wildlife species, populations, and management needs. Deer, turkey, and bear populations are normal for the ridge and valley providence There is some grouse, grey squirrels and raccoons.

Water availability and use. One to very little Hughes Draft, Spring Branch, and Hickory Lick are the biggest water sources

Livestock operations: NONE

Timber: According to stand records, Oliver Mountain includes acres of land suitable for timber production

Minerals: There is no anticipated demand for leasing of federal minerals

Cultural Resources: NONE KNOWN

Authorized and potential land uses: NONE

Management considerations including fire, insects and diseases, and presence of non-federal lands: In about 5-7 years, the gypsy moth will be causing defoliation and mortality in Oliver Mountain Public access is severely limited by private land

What outputs are currently produced or could be produced in the future? NONE

Is the area located such that the need for increased water production and/or additional onsite storage is so vital that installation or maintenance of improvements is an obvious and inevitable public necessity? NO

Would wilderness designation seriously restrict or prevent the application of wildlife and/or threatened and endangered plant or animal management measures of considerable magnitude and importance? NO

Is it a highly mineralized area of such strategic or economic importance and extent that restrictions or controls due to wilderness designation would not be in the public interest? NO

Does the area contain natural phenomena of such unique or outstanding nature that general public access and special development to facilitate public enjoyment should be available? NO

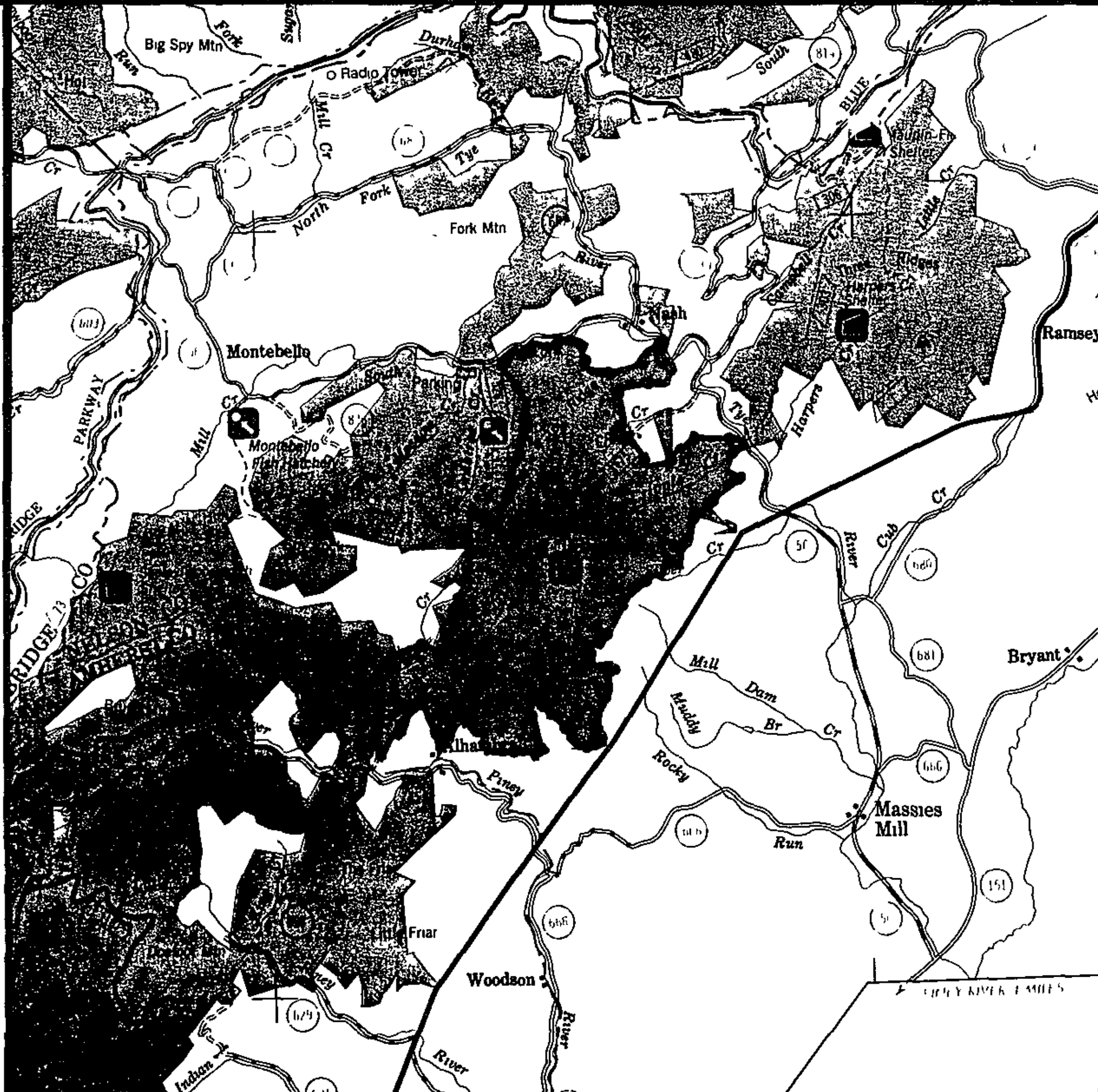
George Washington National Forest
Pedlar Ranger District

THE PRIEST ROADLESS AREA

Scale

1:126,720

1/2 inch = 1 mile



Roadless Area

THE PRIEST ROADLESS AREA

I. DESCRIPTION

Acres: approximately 5,726

Location and vicinity. The Priest is located in the northeast portion of the Pedlar Ranger District of the George Washington National Forest, east of the Blue Ridge Parkway in Nelson County, Virginia It includes the consolidated National Forest ownership between State Route 56 (north side), State Route 826 and Forest Roads 1238 and 263 (west side), State Route 827 (south side), and the National Forest boundary on the east side

Describe access to the area including roads and trails leading to the area Access to the area is possible by those roads noted above Direct access to the boundary is possible by several private farm roads, Forest Road 1175, and the Appalachian National Scenic Trail

General description of the area's geography. The area is underlain by great diversity of rock types that owe their origin to a wide variety of sedimentary, igneous and metamorphic processes Resting atop the Blue Ridge Complex, called the Blue Ridge-Catoctin Mountain anticlinerium, is a sequence of Cambrian volcanic and sedimentary rocks Soils are from the Haysville-Porters-Lew and Parker-Edneytown Associations

General description of the area's topography The main topographic features in the area are The Priest Mountain (elevation 4,063 feet), Little Priest (3,733 feet), and Pinnacle Ridge (3,255 feet) The lowest elevation is 997 feet above sea level at the point where the Appalachian Trail enters the area from the north at State Route 56 The area is generally very steep and rugged The topographic pattern consists of steep undulating ridges with deep V shaped hollows Large rock outcrops are common throughout Most of the streams were partially, if not completely scoured during Hurricane Camille in August of 1969 Landslides which occurred during the hurricane have healed, except in cases where they have eroded to bedrock Water flows from Shoe Creek into the Piney River and from Crabtree Creek, Coxs' Creek, Cripple Creek, Silver Creek, Mill Dam Creek and Rocky Run into the Tye River The Piney River and Tye River flow into the James River Basin of the Middle Atlantic Drainage Area

General description of the area's vegetation, including the ecosystem type The area is entirely forested with species of the Eastern Deciduous forest type characteristic of the Blue Ridge Chain of the Appalachian Mountain System Chestnut and scarlet oak predominate on the dry, rocky ridges and slopes Mixtures of northern red oak, white oak, hickory, white ash, red maple, black cherry, black oak, Virginia pine, white pine, pitch pine, black locust, and some black walnut are scattered in the overstory and understory Cove hardwood species, such as yellow poplar, sugar maple, basswood, ash, birch and hemlock, prevail on the lower and moist sites Mountain laurel is also abundant in the lower understory, along with dogwood, grape, and rhododendron Remnant apple trees are associated with old orchards and home sites, along with persimmon, sassafras, locust, and southern pine

Key attractions, if any, including sensitive wildlife and scenic landmarks This area contains spectacular mountain scenery The Appalachian National Scenic Trail provides interior access to very rugged terrain Vistas from the Appalachian Trail are restricted due to the closed vegetative canopy, however, spur trails to overlooks, rock outcrops, and waterfalls provide magnificent views of the surrounding area There are many very large hardwood trees on the lower, moist sites

There are no records of any sensitive wildlife species A detailed inventory of the area's flora and fauna has not been completed

II INVENTORY

<u>Human Influence</u>

To what degree have humans and past and present human activity affected natural ecological processes and conditions? In 1911, Congress authorized the purchase of forest land in the East to protect the headwaters of navigable streams Many of the lands purchased, including those in the Priest, contained private timber reservations lasting from 7 to 10 years Execution of these reservations, the devastation of the American Chestnut by blight, and the frequent forest fires interacted to create the forest resources which exist within the area today Recent activites include those in association with the Appalachian Trail, fire suppression and some timber cutting in the lower area of Coxs' Creek The majority of the area has been under custodial management since government acquisition

To what degree is the area natural or natural appearing and free from disturbance? Little evidence of turn-of-the-century activities would be evident to the casual visitor Timber was harvested from the lower portion of Coxs' Creek in 1980 The very limited number of old skid trails and haul roads have grown over with vegetation and have healed, and are being used as hiking or horse trails

Activities in association with the Appalachian Trail are visually evident but have not had any significant or permanent influence on the area's ecological processes There are periodic improvements and maintenance to the Priest Trail Shelter, the Appalachian Trail, and associated side trails The last fire was caused by lightning in 1988 It was 1 acre in size

If the area's ecological processes and/or natural appearance have been altered by past or present human activity, is the land regaining a natural, untrammeled appearance? The area appears very natural

Does the existing or attainable National Forest System ownership pattern, both surface and subsurface, ensure perpetuation of identified wilderness value? There are no apparent ownership patterns that would preclude perpetuation of wilderness values

Is more than 15 percent of the area in non-native vegetation? NO

<u>Improvements, Structures, and Nonconforming Uses</u>

Are any of the following types of areas, features or nonconforming uses present? If so, where?

Areas with evidence of historic mining at least 50 years old (Do not include areas of significant current mineral activity). NONE

Areas under current mineral lease that contain a "no surface occupancy" stipulation: NONE

Areas under current mineral lease where the lessee has not exercised development and occupancy rights: NONE

Recreation improvements such as occupancy spots or minor hunting or outfitter camps The Priest Appalachian Trail Shelter is located within the area A picnic table, fire grill, and pit toilet are located at the shelter Primitive, dispersed camp spots are scattered throughout the area, but are inconspicuous Signs are present along the trails

Timber harvest areas where logging and prior road construction are or are not evident. Old timber haul roads and skid trails are overgrown and are only evident to the keen observer Many of these roads are now being used as hiking and horse trails Major logging took place in the western part of the area as late as 1945 The South River Lumber Company extended their railroad to Crabtree Meadows The only evidence remaining of this active logging are American chestnut stumps and the pole size second growth timber in the area In 1980, 50 acres of clearcutting and 40 acres of intermediate cutting (thinning) occurred in the Coxs' Creek drainage

Cultural treatments involving plantations or plantings. The limited degree of timber stand and wildlife habitat improvements are not evident

Private inholdings in the area. NONE

Dwellings on private inholdings· NOT APPLICABLE

Nonconforming structures and improvements: The Priest Shelter on the Appalachian Trail with a picnic table, fire grill, and pit toilet exists within the area

Ground-return telephone lines: NONE KNOWN

Watershed treatment areas· NONE

Roads: NONE

Can existing nonconforming uses be effectively mitigated or terminated through removal or rapid natural deterioration? The Appalachian Trails basic purpose and character are primitive in nature and generally consistent with the management of areas as wilderness The AT and its related structures may represent a desirable existing use that provides for visitor health and safety Traditional trail-marking and footpath maintenance should continue Mechanized or motorized tools would not be used for maintenance, except as expressly allowed by the land-managing agency

Are improvements in the area being affected by the forces of nature rather than humans, and are they disappearing or muted? The improvements noted above in "f" and "n" are being currently maintained for long-term needs

III. EVALUATION

Capability

Does the area contain the basic characteristics that make it suitable for wilderness designation without regard to its availability for or need as wilderness? Consider the following characteristics in analyzing the quality of the wilderness resource If these characteristics are determined to be important, describe and refer to them

Experiential benefits. Does that area provide the opportunity for solitude and serenity? There are some opportunities in this area for solitude and serenity Hikers frequent the Appalachian Trail and shelter sites Private land developments are visible in the distance from some of the overlooks

Challenge. Does the area offer visitors the opportunity to experience adventure, excitement, challenge, initiative, or self-reliance. Is access easy or difficult? Access is reasonably easy due to the Appalachian Trail and adjacent roads This section of the Appalachian Trail is relatively steep and arduous The rugged terrain offers ample opportunities for adventure and challenges Cross-country foot travel would be dangerous and difficult to the novice

Outdoor Recreation Opportunities. What is the area's capability for providing primitive and unconfined types of recreation including·

Camping - There are numerous locations suitable for primitive camping

Hunting - This activity is readily available for some small and large game species, however, use doesn't appear to be too high because of limited motorized access and the rough terrain

Fishing - Coxs' and Cripple Creeks are listed as Class II wild trout streams However, these fisheries provide very limited opportunities inside the Priest area

Mountain Climbing - Some suitable terrain is available for this activity

Ski Touring - This activity is not practical because of the limited quanitity of snow and lack of suitable routes

Canoeing - There are no streams or rivers large enough to support this activity

Boating - There are no streams or rivers large enough to support this activity

River Rafting - There are no streams or rivers large enough to support this activity

Backpacking - The area is excellent for the resident and through hiker

Hiking - Same as for backpacking above The trails are in acceptable condition and loop trip opportunities exist by using trails outside the area

Riding - Riding opportunities are extremely limited The Appalachian Trail is restricted by law to foot travel only

Photography - Good opportunities exist

Special Features

What is the area's capability to provide outdoor education and scientific study, both formal and informal, in a manner compatible with wilderness? Opportunities exist in a variety of areas, such as in geology, archeology, biology, and dispersed recreation

Is there an abundant and varied wildlife population? The presence of game and non-game animals would typify an eastern hardwood forest in the Blue Ridge Mountains characterized by rather remote, rugged, and mature forest conditions Accurate populations figures are not available for this area

A complete inventory of the area's flora and fauna has not been completed

Manageability·

What are the characteristics of the surrounding area including ROS classification, adopted VQO, and present and planned uses? *ROS on a majority of the area is Semi-Primitive Non-Motorized (SPNM) Areas in the lower portions of Coxs' and Cripple Creek* are classified Roaded Natural (RN) VQO primarily varies from retention (R) to partial retention (PR), because of distinctive landscape and aesthetic values along the main travel and seen routes

Future land use will continue to stress aesthetic values in association with agricultural, residential, and recreational uses The private Wintergreen Resort development is only a short distance to the northeast Crabtree Falls and Montebello Campgrounds (private) and Crabtree Falls Observation Site (NF) are located just to the west of the area Adjacent private lands are valued for their apple orchards and other agricultural uses Development of private land for residential purposes is gaining in attention and importance

Do boundary locations conflict with important existing or potential public uses outside the boundary that might result in demands to allow nonconforming structures and/or activities in the wilderness? Even though development is likely to continue on private land around and near the boundary, encroachments are not expected to be a serious problem or concern

Is it possible to readily and accurately describe, establish, and recognize boundaries on the ground? YES The current National Forest boundary is marked

Do boundaries, where possible, conform with terrain or other features that constitute a barrier to prohibited use? Some portions of the boundary are located in areas that would be difficult to cross or access However, there would be many areas where the prohibited use of motorized vehicles, such as ATVs, would be difficult to administer

Do boundaries, to the extent practicable, act as a shield to protect the wilderness environment inside the boundary from the sights and sounds of civilization? The rugged, forested terrain provides some degree of protection along some of the boundary However, farm scenes, homes, and apple orchards are evident along the boundary in several locations Private developments and public roads near the boundary can be expected to create some sounds

Do boundaries provide adequate opportunity for access and traveler transfer facilities? YES

Availability

Describe other (nonwilderness) resource demands and uses

Recreation - As noted previously, the area serves the dispersed recreation users of the Appalachian Trail Hunting is second in importance to hiking and doesn't appear to be high. There is some ATV trespass in the vicinity of Shoe Creek, Little Priest, Pinnacle Ridge, and Coxs' Creek

Information on Wildlife Species, Populations, and Management Needs - The area contains game and non-game animals commonly found on the eastern side of the Blue Ridge Mountains Since the Priest area has been essentially under custodial management, species associated with late-successional habitat and undisturbed forest land prevail Turkey is currently the featured wildlife species

Water Availability and Use - A water source is located at the trail shelter Water is readily available for wildlife

Livestock Operations - NONE

Timber - Even though there are some good sites with quality timber, any attempt to harvest this timber would be very difficult due to limited access and steep terrain Road development is not considered economically feasible There are no activities currently planned

Site indices generally run in the 40s and 50s for the upland oaks on the ridges, 70s and 80s for the oaks on slopes, and 80 to 100 for the cove species

Minerals - There are no outstanding rights The area has no known potential for oil and gas recovery

Cultural resources - Much of the terrain found within the present roadless area is too steep and rugged to have provided camping opportunities for prehistoric populations There are, however, a number of areas that would have offered prehistoric populations

resources necessary to sustain their populations Numerous prehistoric sites, ranging in age from Middle Archaic to Late Woodland, have been recorded within the area Additional surveys should result in the discovery of more prehistoric sites The area has not been investigated to an extent that signficance of the sties can be addressed

Many of the springs, campsites, gaps, and overlooks along the Trail were used by native Americans These sites, and the objects and other physical evidence left behind by these travelers and settlers, are an important part of our cultural heritage Artifacts have been found at Priest shelter, Coxs' Creek, Pinnacle Ridge, and the saddle between The Priest and the Little Priest There are no conflicts with current/future management needs under the Antiquities Act of 1906, the National Historic Preservation Act of 1966, the Archaeological Resource Protection Act of 1979, and several other laws providing protection for cultural resources on federally owned lands

Several historic sites have also been recorded within this area This includes a cemetery in the vicinity of Coxs' Creek that is fenced Several graves, however, lie outside the fenced portion of the graveyard Determinations of significance have not been conducted on these historic sites

Authorized and Potential Land Uses - There are no special uses authorized in the area, nor are any anticipated This is a Memorandum of Understanding with the Natural Bridge Appalachian Trail Club for managing this National Scenic Trail in the Priest area

Management Considerations Including Fire, Insects and Diseases, and Presence of Non-Federal Lands - Because of the protection from fire under National Forest status, and the successful fire suppression efforts when fires have occurred, there is a considerable buildup of light and heavy fuels in the area Due to the terrain and access, suppression would almost of necessity be by hand and/or air attack

Potential spread of the gypsy moth is extremely high since oaks are the preferred host species Egg mass numbers are increasing and some defoliation and mortality can be expected in the near future

There are no private in-holdings

What outputs are currently produced or could be produced in the future? Dispersed recreation activities, primarily hunting and hiking (including backpacking), should continue at about the same level - low to moderate use The prominence and visibility of The Priest make it desirable to manage in a natural appearing state Conventional and cable logging methods are presently impractical, since development and removal costs would far exceed timber values

Is the area located such that the need for increased water production and/or additional onsite storage is so vital that installation or maintenance of improvements is an obvious and inevitable public necessity? NO

Would wilderness designation seriously restrict or prevent the application of wildlife management measures of considerable magnitude and importance? NO

Is it a highly mineralized area of such strategic or economic importance and extent that restrictions or controls due to wilderness designation would not be in the public interest? NO

Does the area contain natural phenomena of such unique or outstanding nature that general public access and special development to facilitate public enjoyment should be available? NO

Is the land needed to meet clearly documented resource demands such as for timber, mineral production, or developed recreation? NO

Is the land committed through contractual agreements for use, purposes, or activities not in concert with wilderness requirements? NO

<u>Need</u>

Other Wildernesses:

How far is it to the closest existing wilderness? The Saint Marys Wilderness of 9,835 acres is located approximately 3 miles to the north of The Priest

What level of use currently exists in near-by existing wilderness? What trends exist in the use of these areas? An estimated 6,000 visitor days of recreation use were recorded in St Marys Wilderness in 1989 This significant amount of use has led to serious

negative impacts on the area's wilderness qualities and resources A ban on campfires along the St Marys River was implemented in an attempt to mitigate these impacts Trends indicate that use in St Marys has steadily increased over time

Is the population in and around these areas increasing or decreasing? How quickly is it increasing or decreasing? The Priest is located in Nelson County where the population grew from 12,204 to 12,550 between 1980 and 1990 In general, the population in Counties surrounding the area has increased steadily over the past ten years.

Nonwilderness lands:

Are there opportunities for unconfined and primitive recreation experiences on nonwilderness areas in the vicinity? If so, where? There are many acres of National Forest land within reasonable distance of The Priest that are suitable and available for primitive type recreation

Habitat·

Are there any biotic species in the area that are directly competing with increasing public use and development? There are no known competing concerns or conflicts.

Could there needs be provided for through means other than wilderness designation? NOT APPLICABLE

Is there a need to provide a sanctuary for biotic species that cannot survive in less than primitive surroundings? This is unknown at the present Studies and data collection are being accomplished by various scientific and interested groups/individuals

George Washington National Forest
Dry River and Deerfield RD

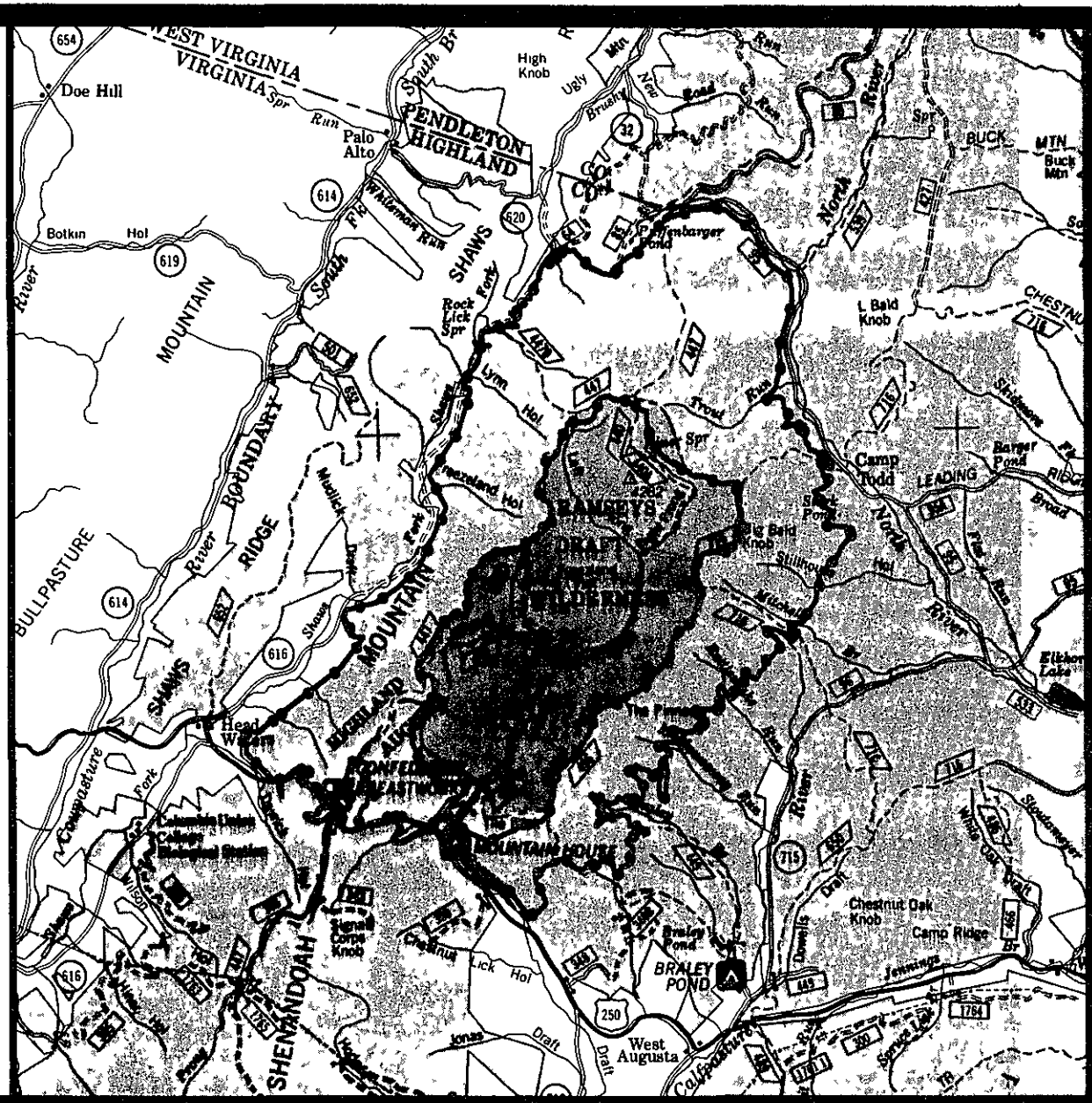
RAMSEYS DRAFT ADDITION ROADLESS AREA

Scale

1:126,720

1/2 inch = 1 mile

Roadless Area



RAMSEYS DRAFT ADDITION ROADLESS AREA

I DESCRIPTION

Acres approximately 12,771

Location and vicinity This area is located north of U S 250 about 20 miles west of Staunton, Virginia It surrounds the existing Ramseys Draft Wilderness on three sides With Ramseys Draft Wilderness as a core, the additional area is bounded on the west by private land in Shaws Fork and north to Forest Development Road (FDR) 64 and then to Puffenbarger Pond The boundary then follows FDR 95, known locally as the North River Road, to a point near Camp Todd The line then goes cross-country and southeast to the vicinity of Stillhouse Hollow The boundary then follows the 2,600 foot contour in a southwestern direction to the intersection with U S 250, approximately one mile east of the Mountain House Picnic area The boundary then follows U S 250 West, leaving the road to exclude a recreation area and private land, across Shenandoah Mountain to the intersection of private land in the Shaws Fork area The Confederate Breastworks Recreation Area and associated interpretive trail to the breastworks are excluded from the area

The part of the proposal that is north of Dividing Ridge is on the Dry River Ranger District the remainder is on the Deerfield District Coordination and management of the land will occur irrespective of the administrative boundaries

Access - Ramseys Draft Addition is accessible by vehicle from U S 250 West, FDR 95 and FDR 96 A number of foot trails also access the area The Shenandoah Mountain Trail north of the Confederate Breastworks transects the area north and south The Wild Oak Trail from FDR 96 leads west up the Dividing Ridge and also from FDR 95 in a southerly direction into the area The Sinclair Hollow Trail comes into the area from FDR 64 Tear Jacket Trail and Spring House Trail leads into the area from FDR 95.

Cross-country access is possible from all adjoining Federal or Forest highways The private land in Shaws Fork effectively blocks access to a large portion of the western edge of the study area

Geography - This area lies along the Shenandoah Mountain chain in the Ridge and Valley Physiographic Province of Virginia and West Virginia. Elevations range from approximately 2,200 feet to 4,200 feet at Hardscrabble Knob, which is inside the existing Ramseys Draft Wilderness Estimated annual average rainfall is 38 inches Snowfall may total several feet in the higher elevations but is generally moderate Temperature extremes vary greatly with an average of 54 degrees Temperatures in the area are typically 5 to 10 degrees cooler than in the Shenandoah Valley due to the influence of elevation

Topography - The topography is steep with short, choppy drainages throughout the lower elevations Slopes vary in steepness with grades up to 80 percent The upper elevations generally flatten out along narrow ridge lines

Dividing Ridge forms the boundary between two major watersheds North of the ridge are the headwaters for Potomac River Basin Drainage south of the ridge flows into the James River Floods in the area have altered many stream channels The most recent flood occurred in November of 1985 Extensive resource damage and property loss occurred on both private and public lands This specific incident was estimated to be a 200-year event

The area is very rocky with poor soils Some short stretches of rock bluffs occur on the eastern edge along the Bald Ridge Trail

Vegetation - The predominate forest type in the area is eastern deciduous hardwood However, there are small patches of pitch pine, table mountain pine and Virginia pine throughout the area Pine is usually found on the high, dry ridges and on south and east facing slopes

Key Attractions - Several attractions are located along the boundary, including Mountain House Picnic Area and the Confederate Breastworks, both along U S 250 Camp Todd, located along FDR 95, is a significant historical site connected with the Civilian Conservation Corps (CCC) Another CCC camp was also located in Ramseys Draft Artifacts and, in the case of Camp Todd, buildings still remain in these areas Dispersed camping areas are located at Camp Todd on the Dry River Ranger District and at Hearthstone Lake Todd Lake campground receives heavy use during the summer months All of these features are located outside of the study area

Ramseys Draft Wilderness is surrounded on three sides by the study area and is receiving an increasing amount of use While most of the use occurs during hunting season, year-round use has been documented Hunting aside, major uses include hiking, backpacking and some horseback riding Fishing for native trout in Ramseys Draft, Jerrys Run and Trout Run is also a popular activity, especially during the high water seasons of spring and fall Other tributaries should see increasing use as area populations and available leisure time grow Fishing will improve as the streams continue to heal themselves following the 1985 flood

II. INVENTORY

Human Influence

To what degree have humans and past and present human activity affected natural ecological processes and conditions? The Civil War era brought significant impacts to the entire area Documentation from this period shows that much of the mountain was clearcut to provide timber for construction of the Confederate Breastworks and other military facilities as well as to provide clear views from the area's peaks The area is now reforested

Since the Civil War, human influence and activity in the proposed area have been ongoing Around the turn of the century, narrow gauge railroads accessed much of the area These railroads facilitated logging and supported the local wood products based economy.

With the late 1920s came the creation of the Civilian Conservation Corps (CCC) The CCC's constructed many roads and trails in the area Most of the trails in the area were built during this time and continue to serve us Roads such as FDR 95 and 96 probably began as CCC projects Workers from the CCC camp in Ramseys Draft built as many as 13 fords across the Draft and the cement headwalls can still be seen

About 50 acres were prescribed burned for wildlife benefits in 1990

There are eight to ten wildlife food plots in the area, averaging one-half acre in size A few of the openings have small man-made ponds associated with them Most of the clearings have had soft mast trees and shrubs, such as crabapple or autumn olive, planted in them.

Several primitive roads still exist in the area and are used occasionally by hikers and hunters Given the extent of past human activity in the area, it is surprisingly natural appearing and only a trained eye can detect the remnants of old tramways and logged areas. Ecological processes seem stable and relatively unchanged

There are no private inholdings in the area

Mineral rights are reserved on approximately 4,870 acres within tract S1 in the Ramseys Draft Addition. That portion of Tract S1 within the study area is located entirely within Highland County The rights are owned by Virginia Mining and Improvement All minerals are retained by the owner, including gas and oil Activation of this ownership, while highly unlikely, would seriously impact the wilderness characteristics of the area

Non-native vegetation covers less than 15% of the area Areas that were logged in the past have been reforested with endemic species

Improvements, Structures, and Non-Conforming Uses

Are any of the following types of areas, features or nonconforming uses present? If so, where?

Areas with evidence of historic mining at least 50 years old: NONE

Areas under current mineral lease that contain a "no surface occupancy" stipulation: There are no current mineral leases or mining activity within the area Mineral rights are outstanding on Tract S1 as previously reported

Areas under current mineral lease where the leasee has not exercised development and occupancy rights: NONE

Recreation improvements such as occupancy spots or minor hunting or outfitter camps: Recreation improvements exist outside but adjacent to the boundary at the Confederate Breastworks and Mountain House Picnic Area Parking areas are provided at Puffenbarger Pond and near Mountain House Picnic Area None of these areas are located inside the area

Timber harvest areas where logging and prior road construction are or are not evident: About 46 acres near Puffenbarger Pond were harvested in 1936 and planted with red pine Another 104 acres were harvested in 1967 This area and an additional 70 acres were site prepared for natural hardwood regeneration in 1970

Timber harvesting has occurred to some extent in all of the major drainages in the past 80 to 90 years, especially on the northern and eastern edges of the proposed area.

Evidence of these activites is not readily apparent Those areas that have recently been harvested are regaining a natural appearance

Cultural treatments involving plantations or plantings: Extensive plantations are not evident

Private inholdings in the area. There are no private inholdings or dwellings inside the boundaries

Dwellings on private inholdings: NONE

Nonconforming structures and improvements. NONE

Ground-return telephone lines: NONE

Watershed treatment area: NONE

Roads: Major roads surround much of the area There are no system roads within the area

ORV/ATV Use· There are no existing designated ORV or ATV trail systems within the Ramseys Draft Addition area No areas have been identified as suitable for the development of an ORV/ATV trail system

Mitigation of non-conforming uses Motorized vehicles have historically been used to access popular dispersed camping sites Even with strict enforcement action, elimination of motorized use in the area would be very difficult to accomplish

Are improvements in the area being affected by the forces of nature rather than humans, and are they disappearing or muted? *The timber sale harvest areas are being managed with periodic inspections and follow-up site treatments with chainsaws to assure* adequate regeneration Wildlife clearings are mowed every other year Wildlife ponds receive maintenance to keep them functioning Closed roads are periodically inspected and re-seeded *All* of the above improvements are visually evident If left to the forces of nature, they would become muted and disappear over time

Timber Harvests - Less than 20% of the area has been harvested within the last 10 years

Roads - There are less than 1/2 miles of improved road for each 1000 acres

Road Management - Road management involves all agencies, i e Federal, State and County These roads include U S 250, FDR 95, and State Route 616. None of these roads are within the area, but serve as the boundary

III. EVALUATION

Capability

Does the area contain the basic characteristics that make it suitable for wilderness designation without regard to its availability for or need as wilderness? Consider the following characteristics in analyzing the quality of the wilderness resource. If these characteristics are determined to be important, describe and refer to them.

Experiential benefits. Does that area provide the opportunity for solitude and serenity? Opportunities for solitude and serenity exist, but the evidence and sounds of civilization remain The sounds of heavy truck traffic can be heard from high ridges and/or deep *within the area*

Challenge. Does the area offer visitors the opportunity to experience adventure, excitement, challenge, initiative, or self-reliance. Is access easy or difficult? Access to the area is relatively easy There are six trails into the area with trail heads located on major highways Travel through the Ramseys Draft Wilderness and the proposed addition will provide a moderate challenge Vegetation is heavy and slopes are steep in most of the area Off-trail, cross country travel would be very challenging

Outdoor Recreation Opportunities What is the area's capability for providing primitive and unconfined types of recreation including.

Camping - There are numerous sites available for primitive camping

Hunting - The area is currently very popular for hunting deer, bear, wild turkey, squirrel, and other small game

Fishing - There may be a few native brook trout in Trout Run This stream is not among the area's best native trout streams

Mountain Climbing - There are no known sites suitable for this activity

Ski Touring - The area is suitable for skiing, however, snow fall is not sufficient to establish ski-touring as a major activity A few local people may cross country ski as conditions permit

Canoeing - There are no streams or rivers large enough to support this activity.

Boating - There are no streams or rivers large enough to support this activity

River Rafting - There are no streams or rivers large enough to support this activity

Backpacking - The area is excellent for backpacking Trips lasting several days are possible

Hiking - The area contains a good system of hiking trails The trail system is especially good for day-trips into the area

Riding - Horse back riding is becoming an increasingly popular activity in the area The current trail system would be suitable for trips lasting one to two days

Photography - Good opportunities

Special Features:

The most notable special feature in both the existing Ramseys Draft Wilderness and the proposed addition are the large trees The steep slopes, combined with the vegetation, make the area very picturesque It provides good bear habitat due to the lack of human disturbance

Manageability:

Lands adjacent to the south, east and north boundaries are inventoried under the Recreation Opportunity Spectrum (ROS) as Roaded Natural Land to the west of the area is inventoried as Semi-primitive, Motorized

The visual quality objective assigned to surrounding lands varies from Modification to Partial Retention to Retention Maps detailing the assigned VQO of the surrounding land are available in the Supervisor's Office located in Harrisonburg, Virginia

The proposed area is bounded on three sides (south, west and north) by either highways or private lands, making the boundaries easy to find and identify on the ground These boundaries offer limited protection to the integrity of the area The private land on the western boundary (Shaws Fork drainage) could possibly be developed, marring the wilderness character

The eastern boundary follows a contour line, which would be difficult and costly to identify, establish, post, enforce and maintain on the ground The contorted shape of this boundary could cause additional problems with management of the adjacent lands outside the area Revision to the area's boundary could be used to mitigate this problem

The area is accessible on all but the western side

The proposed addition totals approximately 12,860 acres When combined with the existing Ramseys Draft Wilderness, the entire area represents 19,378 acres

Availability

Describe other (nonwilderness) resource demands and uses What current uses exist?

The area's primary use is for recreation purposes Most of this use currently occurs during the hunting and fishing seasons Backpacking and hiking use are increasing but not to the point where associated impacts detract from the wilderness environment

No livestock grazing is authorized in the area None has occurred in the area in many years

ORV and ATV activity has increased in the last five years Efforts to curtail this illegal activity have been largely unsuccessful to date *Indications are that this illegal use is occurring in the designated wilderness and, therefore, would also be a problem in the study area*

Ramseys Draft Addition consists of steeply sloping ridges and hollows containing first or second order intermittent streams Most of the underlying geological formations are sandstone or shale The lack of a good perennial water source and flat terrain on which to *camp serve as factors to limit the prehistoric occupation of most of the area The only areas suitable for prehistoric sites would appear* to be in the northern portion on the terraces and/or fans along Brushy Run and Trout Run,

Historic use of this area began fairly early during the development of Augusta County Mountain House, which lies outside the proposed boundary, served as a tavern during the early 1800s A toll booth for the old Parkersburg-Staunton turnpike was located near this area, but the exact location of this booth is unknown at this time Civil War activity is well documented within this area, especially during the spring of 1862 when both Confederate and Union forces occupied the Breastworks on the crest of Shenandoah Mountain Stonewall Jackson's army marched through the area in early May of 1862 prior to the battle at McDowell Confederate and perhaps Union forces camped in the hollows at the foot of the Mountain. Such camp locations have not been identified in the field but were documented in various literature sources on the Civil War

Civil Conservation Corps camps were located within Ramseys Draft and along North River The North River site lies outside the boundary, and the Ramseys Draft camp has already been included within the existing wilderness The floods of 1969, 1972, and 1985 had devastating effects on the Ramseys Draft CCC camp Following the 1985 flood, an inventory along the stream revealed scoured out trash pits, scattered glass and ceramic artifacts, and the flagpole that came from the camp Portions of the area along the stream channel that were not scoured were covered with large boulders, cobbles, or sand deposits Archeological study at this particular camp would be extremely difficult to perform

The picnic area at Mountain House offers an excellent opportunity for interpretation, both concerning the tavern and the CCC camp Interpretative facilities would be located outside the wilderness boundary

Civil War interpretation has been attempted at the Breastworks on the crest of Shenandoah Mountain A trail follows portions of the Breastworks on the northern side of Route 250 The accuracy of the interpretive signs and the trail itself will be studied and revised to provide the interested public with a more realistic description of this site's role in the Civil War

Fire has played a continuous role in shaping the vegetation of the area Fire control using motorized equipment will be limited with wilderness designation Control efforts will be limited to hand tools, except with authorization from higher officials

Other management concerns focus on the building epidemic of the Gypsy Moth Defoliation and mortality resulting from this insect could change the area's makeup and detract from the characteristics that have generated interest in wilderness designation This is especially true if defoliation results in mortality of the old, large trees that exist in some locations The latest data from Gypsy Moth sampling indicates that the infestation is building and can be expected to reach a peak in the area within a few years Control efforts, primarily aerial spraying, could reduce mortality in the area

High winds and water have taken a toll on some of the remaining old growth Substantial change has been noted in the existing Ramseys Draft stream channel Downed timber is commonly seen on trails throughout the proposed addition, making trail maintenance a difficult task

Timber management will be affected by wilderness designation The majority of the area is composed of steep, high and dry slopes and ridges which support low quality timber and which are mostly inaccessible Lands adjacent to the North and Little Rivers are relatively flat and contain some of the better timber producing sites on the District Many of these sites have been excluded from the study area by locating the east and north boundaries on the 2,600 foot contour Some of the larger drainages are also capable of producing high quality sawtimber, but are difficult to access and economically log Site indexes vary from an occasional 80 for oak in the deep moist drainages to 40 or less on the higher slopes The average site index is 60 for oak

Ramseys Draft Addition contains high quality red oak, white oak, hemlock, white pine and other commercial species, however, the areas are generally not very large The majority of the timber is poor quality scarlet oak, chestnut oak and black oak with an understory of laurel, huckleberries, and oak regeneration This area is generally very dense and difficult to penetrate Much of the timber is in excess of 80 years of age and considered to be past maturity from a timber management point of view Natural mortality is evident in existing stands

Current and future outputs Dispersed recreation activities, primarily hunting, fishing, primitive camping, and hiking should continue

Water production and needs There is no need for on-site water storage in this area

Would wilderness designation seriously restrict or prevent the application of wildlife management measures of considerable magnitude and importance? No such measures are being applied at this time A complete inventory of the area's flora and fauna has not been conducted There is a possibility that the higher elevations around Shenandoah Mountain could support some rare species that would benefit from management measures

Are minerals strategic or important in this area? No minerals of strategic importance are known at this time

Does the area contain natural phenomena of such unique or outstanding nature that general public access and special development to facilitate public enjoyment should be available? NO

Is the land needed to meet clearly documented resource demands such as for timber, mineral production, or developed recreation? NO

Is the land committed through contractural agreements for use, purposes, or activities not in concert with wilderness requirements? NO

Need

Other Wildernesses:

The National Wilderness Preservation System includes 174,550 acres of designated wilderness in the state of Virginia and 78,131 acres in the Monogahela National Forest in West Virginia These areas are shown in Table 1

The existing Ramseys Draft wilderness is directly adjacent to the Ramseys Draft Extension Saint Marys Wilderness, the next closest wilderness, is on the Pedlar Ranger District and is approximately 45 miles from Ramseys Draft

According to Recreation Information Management (RIM) use records, there were a total of 3,000 recreation visitor days of use in the Ramseys Draft wilderness in 1989 Trends indicate a steady increase in use of the area Impacts from recreation use are beginning to appear in portions of the Ramseys Draft wilderness, indicating over-use of the area

The population in Augusta County increased at an annual rate of 0 5 percent between 1980 and 1990 It is projected to continue to grow over at least the next five years. Highland County's population, on the other hand, decreased at an average annual rate of 1.9 percent Populations in the Shenandoah Valley to the east are expected to increase steadily over the next few years

Nonwilderness Lands.

There are several nonwilderness areas on the Deerfield District that can provide for primitive and unconfined recreation These areas are located on both sides of Great North Mountain and Shenandoah Mountain

Habitat:

As reported by the Virginia Department of Conservation and Recreation's Division of Natural Heritage, Ramseys Draft Addition contains a portion of the area they have recommended for Special Interest Area (SIA) designation called Little Bald Knob The Heritages Little Bald Knob area is located along the ridge of Shenandoah Mountain and includes those lands that are above the 3,400 foot contour The southern boundary of the area joins the existing Ramseys Draft Wilderness

Within the Heritages proposed Little Bald Knob SIA, the Division has identified four species of concern as listed below These species reside in the immediate vicinity of the Ramseys Draft Addition, but may or may not reside within the proposed boundary

Scientific Name	*Common Name*
Betula papyrifera	Paper birch
Nannaria shenandoah	Shen Mtn xystidermid millipede
Plethodon punctatus	Cow Knob salamander
Poa languida	Drooping bluegrass

With the exception of paper birch, these species are all ranked by the Virginia Natural Heritage Program as being critically imperiled in the state of Virginia. Paper birch is ranked as rare or imperiled in Virginia The millipede Nannaria shenandoah is also ranked as

being critically imperiled globally. Of these four species, paper birch, the Cow Knob salamander and drooping bluegrass are listed in the state of Virginia as being Recommended for Special Concern. This listing reflects the findings of the 1989 Virginia Endangered Species Symposium and is not a legal designation, nor have these species been formally proposed for listing in the state

Finally, the Cow Knob salamander is a candidiate for possible federal listing. The U.S Fish and Wildlife Service is seeking additional information on the salamander before making a determination

The George Washington National Forest is cooperating with the U.S. Fish and Wildlife Service in developing a conservation strategy for the Cow Knob salamander in the form of a pre-listing recovery plan This plan will specify standards by which the area will be managed to ensure the viability and long conservation of this species

In its recommendations for protection, the Heritage Program states that "the proposed area should be designated as a Special Interest Area (SIA). Management should be suitable for the maintenance of rare species populations and for maintenance of their habitats. Since *Plethodon punctatus* and associated rare species occur only on a relatively narrow habitat, fragmentation and genetic isolation of populations can occur. Free flow of genetic information must not be impeded... "

No known special biotic needs, either plant or animal, within this area will be degraded by wilderness designation. While the inventory of the area's species has not been completed and the exact habitat needs of rare species are not known, it is possible that some species may need or benefit from active management. Wilderness designation might preclude or make such efforts more difficult.

George Washington National Forest
Warm Springs Ranger District

ROUGH MOUNTAIN ADDITION ROADLESS AREA

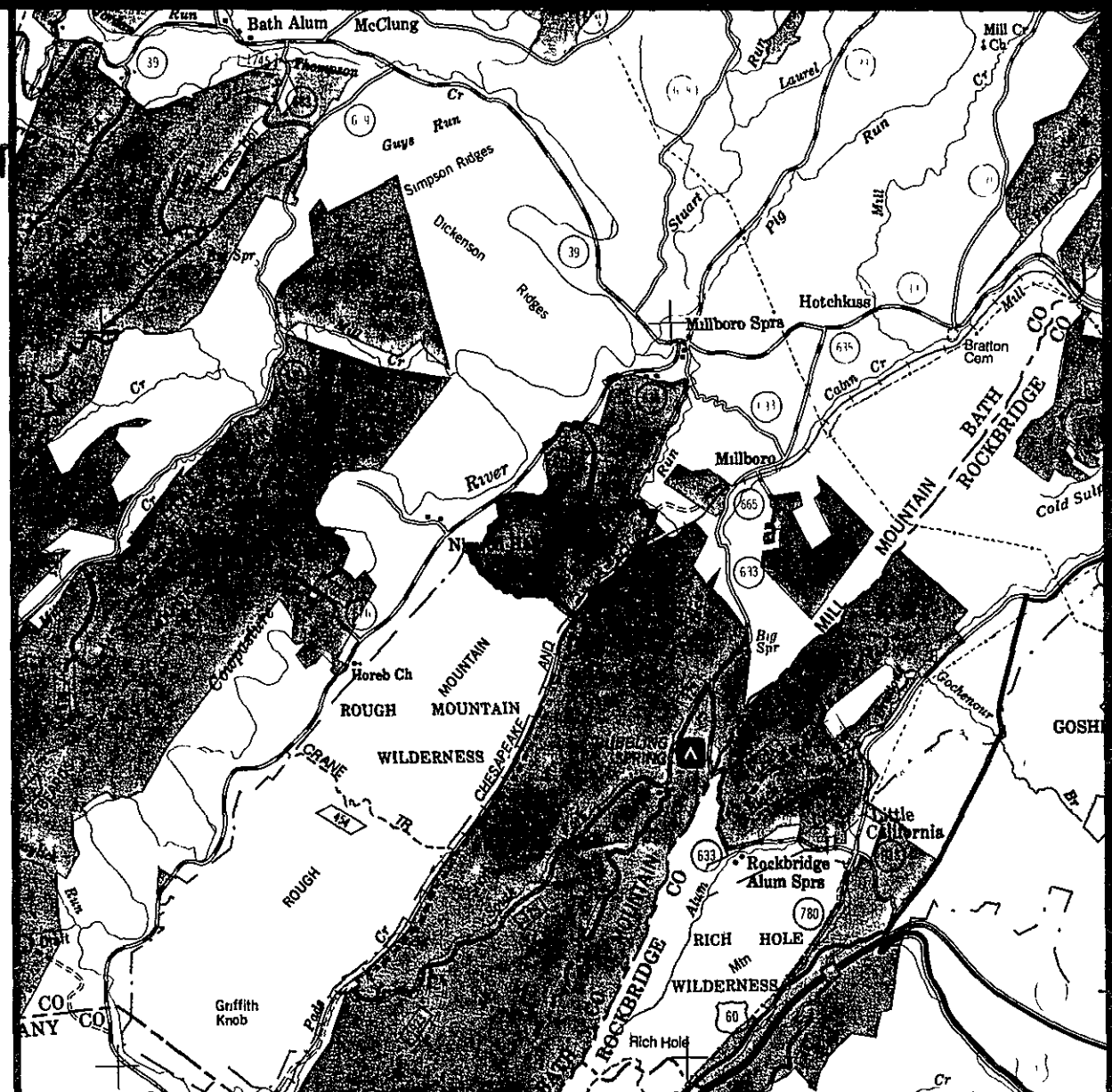
Scale

1:126,720

1/2 inch = 1 mile

Roadless Area

Final



ROUGH MOUNTAIN ADDITION ROADLESS AREA

I DESCRIPTION

Acres. *approximately 1,131*

Location and vicinity. Rough Mountain Addition is located in southeastern Bath County on the Warm Springs Ranger District, George Washington National Forest, adjoining the northern boundary of Rough Mountain Wilderness

Describe access to the area and including roads and trails leading to the area Access is provided by Coffee Pot Road, Forest Service Road 462, on the north, and by the railroad access road on the east No trails exist in the area

General description of the area's geography Rough Mountain Addition lies in the Ridge and Valley Province of Virginia It contains an extension of Rough Mountain and Big Hollow drainage, with associated smaller drainages

General description of the area's topography. Elevations range from approximately 2,100 feet on Rough Mountain to approximately 1,400 feet near Lick Run on the northeast corner Slopes vary from moderate to steep

General description of the area's vegation, including the ecosystem type *Vegetation in Rough Mountain Addition consists of a* mixed eastern hardwood forest Oaks and hickories occur on northern and eastern slopes, and other moist sites The most fertile sites, usually in the deeper, more moist drainages with good soils, contain cove hardwoods including black and red oak, birches, ashes and maples The least fertile sites, on ridgetops and southern and western exposures, contain oaks, yellow pines, hemlock and white pine

Understory vegetation also varies with aspect and moisture regime of a site Riparian vegetation exists along perennial and larger intermittent streams The driest sites contain fetter bush, scrub oaks, and yellow and white pine regeneration Intermediate sites contain pine and hardwood regeneration, understory tree species such as dogwood and black gum and sparse amounts of herbaceous plants

Key attractions, if any, including sensitive wildlife and scenic landmarks No key attractions are known Some rare shale barren plants are known to exist in the general area and may be found in Rough Mountain Addition

II INVENTORY

Human Influence

To what degree have humans and past and present human activity affected natural ecological processes and conditions? Most of Rough Mountain Addition was cut over in the late 1800s and early 1900s Most stands are now about 90 years old Rough Mountain Addition burned frequently prior to government acquisition

These activities have not affected natural ecological processes and conditions in Rough Mountain Addition to a significant degree

To what degree is the area natural or natural appearing and free from disturbance? Except for old logging trails, Rough Mountain Addition generally appears natural and free from disturbances Sounds from traffic on State Highway 42 and from trains on the CSX track will create some disturbance in Rough Mountain Addition

If the area's ecological processes and/or natural appearance have been altered by past or present human activity, is the land regaining a natural, untrammeled appearance? Most of Rough Mountain Addition has regained a natural, untrammed appearance following logging in the early 1900s

Does the existing or attainable National Forest System ownership pattern, both surface and subsurface, ensure perpetuation of identified wilderness value? All of the surface and subsurface resources within Rough Mountain Addition are federally owned

Is more than 15 percent of the area in non-native vegetation? NO

Improvements, Structures, and Nonconforming Uses

Are any of the following types of areas, features or nonconforming uses present? If so, where?

Areas with evidence of historic mining at least 50 years old (Do not include areas of significant current mineral activity): NONE

Areas under current mineral lease that contain a "no surface occupancy" stipulation: NONE

Areas under current mineral lease where the leasee has not exercised development and occupancy rights: NONE

Recreation improvements such as occupancy spots or minor hunting or outfitter camps: There are primitive, dispersed camp spots along the railroad access road up Big Hollow

Timber harvest areas where logging and prior road construction are or are not evident. There is no obvious evidence of past logging, although there has been some firewood cutting of dead and down timber in Big Hollow

Cultural treatments involving plantations or plantings· NONE

Private inholdings in the area: NONE

Dwellings on private inholdings: NONE

Nonconforming structures and improvements: NONE

Ground-return telephone lines: NONE

Watershed treatment areas: NONE

Roads· There are some old jeep trails up Big Hollow

Can existing nonconforming uses be effectively mitigated or terminated through removal or rapid natural deterioration? All nonconforming uses have effectively deteriorated

Are improvements in the area being affected by the forces of nature rather than humans, and are they disappearing or muted? Past improvements have become muted over time

III. EVALUATION

Capability

Does the area contain the basic characteristics that make it suitable for wilderness designation without regard to its availability for or need as wilderness? Consider the following characteristics in analyzing the quality of the wilderness resource. If these characteristics are determined to be important, describe and refer to them.

Experiential benefits. Does the area provide the opportunity for solitude and serenity? By expanding the existing Rough Mountain Wilderness, Rough Mountain Addition will serve to improve opportunities for solitude and serenity in the area

Challenge. Does the area offer visitors the opportunity to experience adventure, excitement, challenge, initiative, or self-reliance. Is access easy or difficult? Access into the Rough Mountain Addition is fairly easy Hiking within this roadless area would be a challenge due to steep terrain and the absence of trails

Outdoor Recreation Opportunities. What is the area's capability for providing primitive and unconfined types of recreation including

Camping - Rough Mountain Addition offers very limited opportunities for primitive camping Trail access and the small size of the area are limiting factors

Hunting - Rough Mountain Addition is a popular hunting location

Fishing - NONE

Mountain Climbing - Mountain climbing opportunities are very limited Those available are suitable for the novice

Ski Touring - NONE

Canoeing - NONE

Boating - NONE

River Rafting - NONE

Backpacking - The absence of trails limits opportunities for backpacking

Hiking - There are no trails within Rough Mountain Addition, although old woods roads provide access

Riding - There are opportunities for horseback riding along the old woods roads

Photography - Photography opportunites are typical of those found elsewhere on the National Forest.

Special Features:

What is the area's capability to provide outdoor education and scientific study, both formal and informal, in a manner compatible with wilderness? *Opportunities are limited due to poor interior access and the area's remote location*

Is there an abundant and varied wildlife population? *Rough Mountain Addition supports black bear, white tailed deer, wild turkey,* squirrels and a number of other game and non-game species typical of the Southern Appalachians.

Manageability:

What are the characteristics of the surrounding area including ROS classification, adopted VQO, and present and planned uses? *To the south in Rough Mountain Wilderness, the VQO is Preservation and the ROS class is primitive North of Rough Mountain* Addition and east of the railroad track the land is classified as semi-primitive motorized and roaded natural To the west, private land *contains home sites and hunt camps along State Highway 42. VQO's to the north and east are Partial Retention and Modification*

***Do boundary locations conflict with important existing or potential public uses outside the boundary that might result in* demands to allow nonconforming structures and/or activities in the wilderness?** Yes, the proposed route of Forest Service Road *462-A is within the northern boundary. This vehicular access route is needed to replace two existing access routes that are located* on private land to the north. Neither of these two routes are covered by legal right-of-way agreements Acquisition of an unrestricted *right-of-way covering either of these two routes would be expensive and would probably require condemnation*

Is it possible to readily and accurately describe, establish, and recognize boundaries on the ground? Yes, the boundary follows property lines or readily identified topographic features

Do boundaries, where possible, conform with terrain or other features that constitute a barrier to prohibited use? Boundaries do not constitute a barrier to prohibited use

Do boundaries, to the extent practicable, act as a shield to protect the wilderness environment inside the boundary from the sights and sounds of civilization? No the eastern boundary follows an existing railroad line

Do boundaries provide adequate opportunity for access and traveler transfer facilities? Yes, adequate access is provided along FDR 462

Availability

Describe other (nonwilderness) resource demands and uses.

Recreation - Some primitive camping occurs along the existing primitive road system

Information on Wildlife Species, Populations, and Management Needs - The area contains game and nongame species typical of the George Washington National Forest A complete inventory of the area's flora and fauna has not been conducted

Water Availability and Use - NONE

Livestock Operations - NONE

Timber - According to stand records, 824 acres are classified as suitable for timber production out of a total of 1,136 acres Portions of the proposed Coffee Pot Timber Sale lie within Rough Mountain Addition

Minerals - There is no anticipated demand for leasing of federal minerals

Cultural Resources - NONE KNOWN

Authorized and Potential Land Uses - NONE

Management Considerations Including Fire, Insects and Diseases, and Presence of Non-Federal Lands - Rough Mountain Addition will probably under go defoliation by the gypsy moth to varying extent over the next 5 years

There have been no large, human-caused fires recently

What outputs are currently produced or could be produced in the future? Rough Mountain Addition provides good opportunities for hunting, especially for deer, bear, turkey and squirrel Most of these popular game species would benefit from opening the forest canopy through timber management practices

Five cutting units of the proposed Coffee Pot Timber Sale are located in or partly within the boundary of Rough Mountain Addition

Is the area located such that the need for increased water production and/or additional onsite storage is so vital that installation or maintenance of improvements is an obvious and inevitable public necessity? NO

Would wilderness designation seriously restrict or prevent the application of wildlife and/or threatened and endangered plant or animal management measures of considerable magnitude and importance? NO

Is it a highly mineralized area of such strategic or economic importance and extent that restrictions or controls due to wilderness designation would not be in the public interest? NO

Does the area contain natural phenomena of such unique or outstanding nature that general public access and special development to facilitate public enjoyment should be available? NO

Is the land needed to meet clearly documented resource demands such as for timber, mineral production, or developed recreation? NO

Is the land committed through contractual agreements for use, purposes, or activities not in concert with wilderness requirements? NO

Need

Other Wildernesses:

How far is it to the closest existing wilderness? The Rough Mountain Wilderness forms the southern boundary of Rough Mountain Addition The Rich Hole Wilderness lies about 3 miles to the east

What level of use currently exists in near-by existing wilderness? What trends exist in the use of these areas? Rough Mountain and Rich Hole Wildernesses both receive low use

Is the population in and around these areas increasing or decreasing? How quickly is it increasing or decreasing? The population of Bath County has remained relatively stable

Studies of visitors to the St Marys wilderness on the Pedlar Ranger District have indicated that visitors often travel up to 100 miles to get to the area In light of this, it is useful to look at the population of the state of Virginia and West Virginia. Between 1980 and 1990, the population of the State of Virginia increased at an annual rate of 1 4 percent while the population for the state of West Virginia decreased at an annual rate of 0 4 percent.

Nonwilderness lands:

Are there opportunities for unconfined and primitive recreation experiences on nonwilderness areas in the vicinity? If so, where? There are opportunities on Forest Service lands at Pads Creek and north of Forest Service Road 462

Habitat:

Are there any biotic species in the area that are directly competing with increasing public use and development? A survey for rare flora and fauna in Rough Mountain Addition has not been completed At this time, there are no known biotic species in Rough Mountain Addition that are directly competing with increasing public use and development

Could their needs be provided for through means other than wilderness designation? NOT APPLICABLE

Is there a need to provide a sanctuary for biotic species that cannot survive in less than primitive surroundings? There is not a need to provide a sanctuary for biotic species that cannot survive in less than primitive surroundings

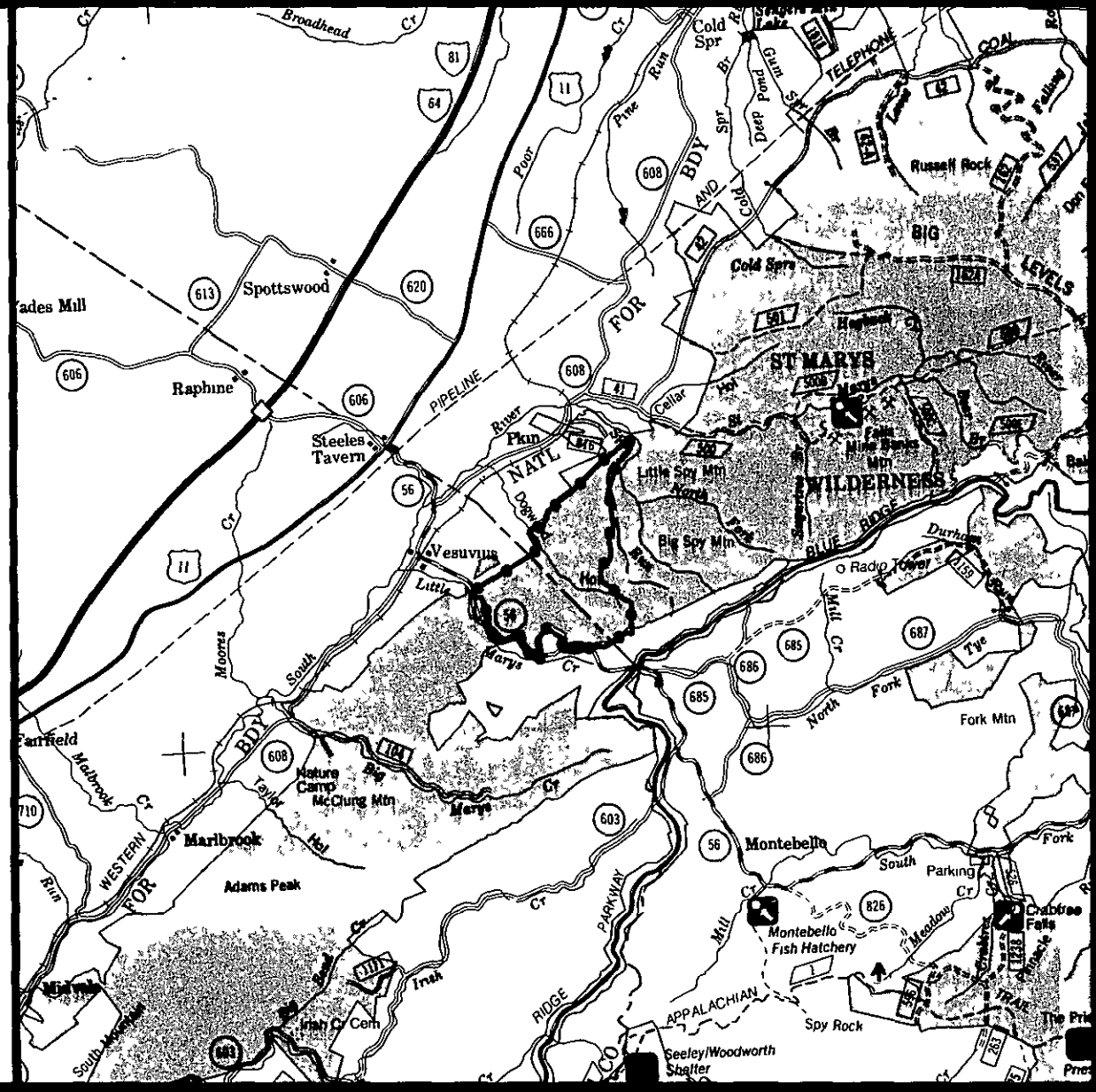
George Washington National Forest
Pedlar Ranger District

SAINT MARYS ADDITION ROADLESS AREA

Scale

1:126,720
1/2 inch = 1 mile

Roadless Area



SAINT MARYS ADDITION ROADLESS AREA

I DESCRIPTION

Acres: approximately 1,441

Location and vicinity. The area is located in Augusta and Rockbridge Counties, Virginia, in the Pedlar Ranger District of the George Washington National Forest The Saint Marys Addition Area lies to the southeast of Vesuvius, Virginia between State Route 56 and the existing Saint Marys Wilderness The eastern boundary borders the Saint Marys Wilderness along Groahs Ridge The southern boundary is the Forest boundary and State Route 56 The northwestern boundary is the Forest boundary in Rockbridge County but meanders in Augusta County to exclude the recent Vesuvius/Kelley Bank Mine Restoration area and recent timber sale projects The northern boundary continues past the mine restoration and timber sale areas, and joins the existing wilderness boundary

Describe access to the area including roads and trails leading to the area. *The boundary can be accessed by State Route 56 and* Forest Road 1816 These roads are open to the public County Road 702 provides access to the mine restoration project and the hiking trail in Dogwood Hollow An old abandoned trail, a former wagon road, connects to State Route 56 about 0 1 miles south from the pulloff at an old quarry site A very primitive hiking trail exists along Groahs Ridge The heavily traveled and popular Blue Ridge Parkway is within one-half mile of the southern boundary

General description of the area's geography. The area lies within the Blue Ridge Physiographic Province underlain by a great diversity of rock types owing their origin to a variety of sedimentary, igneous and metamorphic processes Cambrian quartzites and shales and the Pre-Cambrian crystalline rock dominate Rock and boulder outcrops are numerous The soil associations represented are the Sherando-Monongahela, Drall-Hazleton-Jefferson/Leetonia, Low-Cataska-Hartleton, the Edneyville associations

General description of the area's topography. Elevations generally range from about 1,700 to 3,000 feet along two main ridges separated by Dogwood Hollow near the Rockbridge and Augusta County Line The terrain is mostly steep and rugged A majority of the steep interior slopes form the watershed that drains into Dogwood Hollow and eventually into South River The drainages in the southwestern portion of the Saint Marys area flow into Little Marys Creek which lies adjacent to State Route 56

General description of the area's vegetation, including the ecosystem type The area is entirely forested and represented by the following forest types, characteristic of a mixed eastern hardwood forest Pitch Pine, White Pine-Hardwood, Pitch Pine-Oak, Virginia Pine, Chestnut Oak, Chestnut Oak-Scarlet Oak-Yellow Pine, White Oak-Red Oak-Hickory, Yellow Poplar-White Oak-Northern Red Oak, and Hemlock-Hardwood

Understory vegetation varies with aspect and moisture regime of the site Thickets of rhododendron, mountain laurel, grape, and hawthorn are common Riparian vegetation occurs along the larger intermittent or perennial drainages Dogwood and blackgum are prevalent soft mast producers

Key attractions, if any, including sensitive wildlife and scenic landmarks. The land is generally rugged and steep, lacking any significant landforms There is some historical interest in the area due to the mining activities of the early 1900s, primarily for manganese and iron Records of 1981 show a bat hibernaculum in a fissure of one of the mines worked during World War II Four species of bat were noted - *Myotis lucifugus*, *Myotis keenii*, *Pipistrellus subflavus*, and *Eptesicus fuscus* Past wildlife management has featured black bear No other sensitive wildlife species are known to exist in the area, but an intensive wildlife survey has not been performed There is a possibility that other sensitive wildlife species exist here

II. INVENTORY

Human Influence

To what degree have humans and past and present human activity affected natural ecological processes and conditions? The *area has had a history of human activity as evidenced by the old trails, one home site, and past mining activities for manganese and* iron ore Prior to government acquisition, it is likely that wildfires were frequent, and that some timber was removed in the 1800s and early 1900s

Man's activities have had little impact on ecological processes and conditions in the area

To what degree is the area natural or natural appearing and free from disturbance? Within the boundaries, the area appears natural Sounds of man within the area originate from low flying aircraft, farm equipment used on adjacent private land, and vehicle

traffic on nearby highways All-terrain vehicles infrequently enter the area. During the past two years, the Southern Pine Beetle has caused mortality on some of the southern pine tree species. Gypsy Moths populations are increasing.

If the area's ecological processes and/or natural appearance have been altered by past or present human activity, is the land regaining a natural, untrammeled appearance? The area appears natural

Does the existing or attainable National Forest System ownership pattern, both surface and subsurface, ensure perpetuation of identified wilderness value? The meandering boundary around the mine restoration site and timber sale projects in the northern corner of the area would be difficult to define on the ground Adjacent private land will continue to be developed for agricultural and residential purposes It is possible that such development might have a negative effect on the area's wilderness qualities

There are outstanding mineral rights for iron, kaolin, and manganese on Tract N-129 (290 acres) and for all minerals on Tract N-130 (117 acres) Area's that were most recently mined have been or could be easily excluded from the area through boundary adjustments

Is more than 15 percent of the area in non-native vegetation? No

Improvements, Structures, and Nonconforming Uses

Are any of the following types of areas, features or nonconforming uses present? If so, where?

Areas with evidence of historic mining at least 50 years old (Do not include areas of significant current mineral activity): It is believed that old mines identified within the area were operating up to and through Wold War II

Areas under current mineral lease that contain a "no surface occupancy" stipulation· NONE

Areas under current mineral lease where the lessee has not exercised development and occupancy rights: NONE

Recreation improvements such as occupancy spots or minor hunting or outfitter camps: NONE

Timber harvest areas where logging and prior road construction are or are not evident. Old roads used for logging are overgrown, but the roadways are still visually evident

Cultural treatments involving plantations or plantings: NONE

Private inholdings in the area: NONE

Dwellings on private inholdings: NOT APPLICABLE

Nonconforming structures and improvements: NONE KNOWN

Ground-return telephone lines· NONE KNOWN

Watershed treatment areas: NONE

Roads· There are no Forest Service system roads within the area Old roads, previously noted, are returning to natural a condition

Can existing nonconforming uses be effectively mitigated or terminated through removal or rapid natural deterioration? While it is not a serious problem, it would be difficult to exclude motorized vehicle traffic from all portions of the area. Private land adjoining the area does provide some opportunities for ORV and ATV trespass

Are improvements in the area being affected by the forces of nature rather than humans, and are they disappearing or muted? An old home site within the area is returning to a natural-appearing condition

III. EVALUATION

Capability

Does the area contain the basic characteristics that make it suitable for wilderness designation without regard to its availability for or need as wilderness? Consider the following characteristics in analyzing the quality of the wilderness resource. If these characteristics are determined to be important, describe and refer to them.

Experiential benefits. Does the area provide the opportunity for solitude and serenity? The area is adjacent to the St Marys Wilderness and provides similar opportunities These opportunities would be lessened on the west and southern sides where private lands adjoin the area Sights and sounds of human activity originating outside the boundary are fairly common

Challenge. Does the area offer visitors the opportunity to experience adventure, excitement, challenge, initiative, or self-reliance. Is access easy or difficult? Access is relatively easy from the adjacent State Route 56 and Forest Road 1816 The rugged terrain does offer an element of adventure and challenge With a limited trail system in place, hiking would be primarily cross-country

Outdoor Recreation Opportunities. What is the area's capability for providing primitive and unconfined types of recreation including

Camping - Suitable locations for primitive camping are available

Hunting - Large and small game hunting use is low

Fishing - Streams with sufficient flow to sustain a native fish population are not present

Mountain Climbing - There are no known areas suitable for mountain climbing

Ski Touring - This is not a suitable activity because of lack of consistent and necessary snowfall

Canoeing - There is insufficient water for this activity

Boating - There is insufficient water for this activity

River Rafting - There is insufficient water for this activity

Backpacking - With the adjoining St Marys Wilderness, the area is excellent for backpacking Trips lasting more than one day are possible Cross-country travel would be difficult due to the rugged terrain.

Hiking - The area is excellent for hiking Most hiking done currently is associated with hunting There is a primitive trail system in place within the area Cross-country travel is difficult due to the steep, rugged terrain

Riding - The old overgrown roads are unsuitable for horse travel. The steepness of the land, even on the primitive trails makes travel by horseback difficult.

Photography - Opportunities for outdoor photography are good

Special Features:

What is the area's capability to provide outdoor education and scientific study, both formal and informal, in a manner compatible with wilderness? The capabilities are similar to the adjacent Saint Marys Wilderness

Is there an abundant and varied wildlife population? The area supports black bear, white-tailed deer, wild turkey, squirrel, and a number of other game and non-game species typical of the Blue Ridge Mountains Abundance of the species may vary and change depending on the habitat and other natural and unnatural influences on the species

Manageability:

What are the characteristics of the surrounding area including ROS classification, adopted VQO, and present and planned uses? *Except for the eastern side along the wilderness, all the surrounding ROS classifications are RN (roaded natural) The VQO* varies from Retention to Modification, depending on viewing perspective - foreground or middle ground

Do boundary locations conflict with important existing or potential public uses outside the boundary that might result in demands to allow nonconforming structures and/or activities in the wilderness? *It is likely that development will continue on* private lands along the boundary on two sides of the area Some of the non-conforming uses occurring on the adjacent private lands, such as all-terrain vehicle use, would be difficult to eliminate from the area

Is it possible to readily and accurately describe, establish, and recognize boundaries on the ground? Except for two short streches, proposed boundaries follow private land and the existing Saint Marys Wilderness Area and could be readily described and

established Where the boundary does not follow private land or the existing wilderness, establishment and recognition of the boundary will be more difficult

Do boundaries, where possible, conform with terrain or other features that constitute a barrier to prohibited use? There are no natural barriers that would eliminate prohibited uses particularly along adjacent private lands or open public roads In some instances, the steepness of the land will limit prohibited vehicle use in the interior of the area

Do boundaries, to the extent practicable, act as a shield to protect the wilderness environment inside the boundary from the sights and sounds of civilization? The forested areas along the National Forest property boundary provide a degree of protection but do not eliminate the sights and sounds of civilization Sounds of vehicles using State Route 56 are noticable in the southwestern portion of the area

Do boundaries provide adequate opportunity for access and traveler transfer facilities? YES

If the area contains less than 5,000 acres·

Due to physiography or vegetation, is the area manageable in its natural condition? YES

Is the area contiguous to existing wilderness, primitive areas, administration-endorsed wilderness, or roadless areas in other Federal ownership? The area is contiguous to the Saint Marys Wilderness

<u>Availability</u>

Describe other (nonwilderness) resource demands and uses

Recreation - The interior region received limited hunting use Currently, there is a minimum amount of camping and hiking

Information on Wildlife Species, Populations, and Management Needs - Game and non-game animals commonly found on the western slopes of the Blue Ridge Mountains of the Appalachians exist within the area Some popular game species might benefit from habitat manipulation practices that provide openings in the forest's canopy Other wildlife species would benefit from the maintenance of the mature forest

Water Availability and Use - Dogwood Hollow is the major drainage and it becomes dry in the summer Springs are scarce Treatment of water from the streams is recommended for safe human consumption

Livestock Operations - NONE

Timber - Even though there are some good sites with quality timber, any attempt at harvest operations would be very limited because of the difficult access and terrain There are no timber harvest activities currently planned

Most of the area's timber is mature and low quality The best sites, usually in the drainages, contain cove hardwood species Poor sites on ridges and south and west facing slopes contain oak, hickory, and yellow and white pine

Minerals - As previsouly noted, there has been some mineral extraction in the past Even though mineral rights, mostly for iron and manganese, are outstanding in a portion of the area within Augusta County, no interest has been expressed for exploration or development The area has no known potential for oil and gas recovery

Cultural Resources - The extremely steep and rugged terrain would have offered little if any opportunity for prehistoric or historic occupation of this area The lack of good perennial water would also have been a limiting factor in the potential for this area to be inhabited. There are several Nineteenth Century iron mines that may also have been mined for manganese during World War I There are no surface structures associated with these mines They are not considered significant cultural resources and would not present any problems with wilderness management

Authorized and Potential Land Uses - There are no occupancy type uses currently authorized, nor are any anticipated in the future

Management Considerations Including Fire, Insects and Diseases, and Presence of Non-Federal Lands. The area will probably be defoliated by the gypsy moth to varying degrees over the next 5 years The Southern Pine Beetle is currently endemic, however, some mortality is evident No treatments for either of these insects are currently planned However, treatments, if performed would involve the use of aircraft or other mechanized equipment

Man-caused fires are not common in the area Natural fires can occur from lightning Regardless of origin, suppression would be difficult Depending on weather and fuel factors, fires could get much larger than necessary if the use of aircraft or other mechanized equipment were not permitted Increased gypsy moth activity anticipated in the near future is expected to add to the problem of an already high fuel loading

What outputs are currently produced or could be produced in the future? Dispersed recreation opportunities, primarily for hunting and hiking, would remain available Wilderness management would provide wildlife habitat for late-successional species such as *black bear, which is currently the featured species The area contains timber and minerals resources that could be harvested to help* meet local demands for these products

Is the area located such that the need for increased water production and/or additional onsite storage is so vital that installation or maintenance of improvements is an obvious and inevitable public necessity? NO

Would wilderness designation seriously restrict or prevent the application of wildlife management measures of considerable magnitude and importance? NO

Is it a highly mineralized area of such strategic or economic importance and extent that restrictions or controls due to wilderness designation would not be in the public interest? NO

Does the area contain natural phenomena of such unique or outstanding nature that general public access and special development to facilitate public enjoyment should be available? NO

Is the land needed to meet clearly documented resource demands such as for timber, mineral production, or developed recreation? NO

Is the land committed through contractual agreements for use, purposes, or activities not in concert with wilderness requirements? NO

<u>Need</u>

Other Wildernesses·

How far is it to the closest existing wilderness? *This area joins the Saint Marys Wilderness Area*

What level of use currently exists in near-by existing wilderness? What trends exist in the use of these areas? According to Recreation Information Management (RIM) use records from 1989, 6,000 recreation visitor days of use were recorded in the St Marys Wilderness Trends indicate a steady increase in use Impacts from this use are starting to show up along the St Marys River and the GWNF has instituted a ban on campfires in the area along the lower portion of the river

Is the population in and around these areas increasing or decreasing? How quickly is it increasing or decreasing? The St Marys addition is located in Augusta and Rockbridge Counties Augusta's population increased from 53,732 to 56,315 between 1980 and 1990 Rockbridge County's population increased from 17,911 to 18,205 over the same period In Albemarle County to the east, the population increased at an average annual rate of 1 3 percent from 55,783 to 63,544

Nonwilderness lands·

Are there opportunities for unconfined and primitive recreation experiences on nonwilderness areas in the vicinity? If so, where? There are many acres of National Forest located nearby that are suitable for primitive recreation

Habitat:

Are there any biotic species in the area that are directly competing with increasing public use and development? Under current management practices, the St Marys Addition is managed to provide remote and relatively undisturbed habitat This management serves to minimize competition between man and wildlife species that are adversely affected by development

A inventory of the area's flora and fauna has not been completed

Could their needs be provided for through means other than wilderness designation? Needs for species requiring undisturbed habitat could be provided for by the establishment of Research Natural Areas, Special Management Areas, or by allocating the area to a management prescription designed to limit or exclude significant human activity

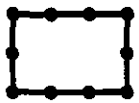
Is there a need to provide a sanctuary for biotic species that cannot survive in less than primitive surroundings? This is unknown at the present Studies and data collection are being accomplished by various scientific and/or interested groups and individuals

George Washington National Forest
Dry River Ranger District

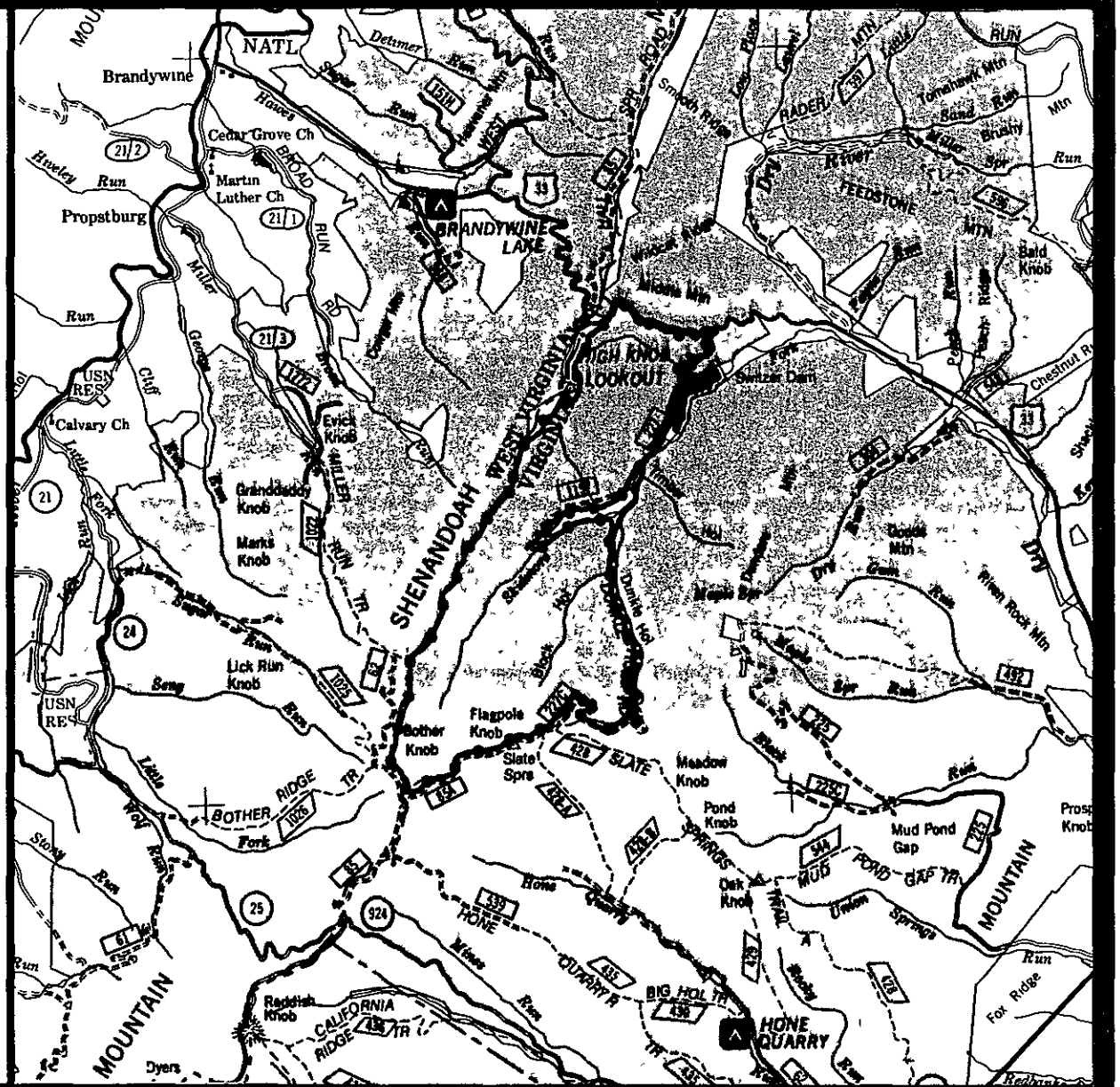
SKIDMORE ROADLESS AREA

Scale

1:126,720
1/2 inch = 1 mile



Roadless Area



SKIDMORE ROADLESS AREA

I. DESCRIPTION

Acres: approximately 5,635

Location and vicinity. The area is located on the Dry River Ranger District, George Washington National Forest It is located in Rockingham County, Virginia The Northern boundary is U S Highway 33 The eastern boundary is Forest Road 227 Forest Roads 85 and 85A form the southern boundary The western boundary is the top of Shenandoah Mountain The top of Shenandoah Mountain also forms the boundary between Pendleton County, West Virginia and Rockingham County, Virginia

Describe access to the area including roads and trails leading to the area. The area can be accessed by the following roads U S Highway 33, Forest Roads 85, 85A, and 227 These roads are open for public use all year Forest Road 227B, approximately 1 8 miles long, enters Block Hollow in the southwestern portion of the area It is currently used for administrative access and is closed to public use

While no trails in the area are listed on the Forest's transportation system, there are numerous non-system hiking trails and old roads throughout the area These old roads and trails are used primarily by hunters, hikers, and motorized recreation users In many cases, these old roads are used by ORVs and ATVs to access the area This use of the area has become well established and elimination of it would present a serious wilderness management problem

General description of the area's geography. The area lies within the Ridge and Valley Physiographic Province of Virginia/West Virginia. It contains mountain ridges with parallel drainages that run in a southwest to northeast direction Spur ridges and associated small drainages project off the Shenandoah Mountain and other major ridges Major geographic features are Shenandoah Mountain, and Skidmore Fork, Block Hollow and Dunkle Hollow drainages

General description of the area's topography Elevations range from about 2,400 feet on the eastern edge in Skidmore Fork to 4,300 feet near Bother Knob on the southwestern side Slopes vary from moderate to very steep and are dissected by numerous small streams

General description of the area's vegetation, including the ecosystem type The area is forested by eastern deciduous and coniferous species Oak and hickory occur on northern and eastern slopes and other moist sites The best sites, usually in the deeper, moister drainages, contain cove hardwoods including black and red oak, birches, poplar, ashes and maples The poorer sites occur on ridge tops and southern and western exposures and contain a mixture of oaks, yellow pines and white pines The head of the Skidmore drainage currently is a Special Management Area (Mgmt Area #3 FLRMP) This management area contains one of Virginia's few remaining examples of virgin eastern hemlock forests The site consists of an open hemlock forest with a few widely scattered hardwoods, primarily Northern red oak, sugar maple, and beech

Understory vegetation varies with aspect and moisture regime Riparian vegetation exists along perennial and larger intermittent streams The driest sites contain fetterbush, scrub oaks, and yellow and white pine regeneration Intermediate sites contain pine and a lesser amount of hardwood regeneration, understory tree species such as dogwood and black gum, laurel, and sparse amounts of herbaceous plants

Key attractions, if any, including sensitive wildlife and scenic landmarks. The virgin hemlock stand at the head of the Skidmore drainage is a key feature of this area This old growth is recognized by the Virginia Division of Natural Heritage as an exemplary natural community It is included in the 1,300 acre Special Management Area in the Forest's Land and Resource Management Plan The SMA also contains several additional species of special concern These are discussed later in this report From a geological standpoint, there are no significant landforms or other prominant features The land is steep and rugged, particularly near the top of Shenandoah Mountain Sensitive wildlife species include black bear, which requires remote habitat, and the Cow Knob Salamader, which is endemic to the higher elevations of Shenandoah Mountain

II INVENTORY

Human Influence

To what degree have humans and past and present human activity affected natural ecological processes and conditions? Except for the deeper, most rugged drainages, such as the head of the Skidmore drainage, most of the area was cut over in the late 1800s and early 1900s Forest cover in the area averages over 90 years of age The area burned frequently prior to government acquisition

About 50 acres on the extreme eastern side of the area has been logged since 1986 There are approximately 15 grassy, man-made wildlife clearings and about 8 man-made wildlife waterholes within the area

Little evidence of turn-of-the-century activities on ecological processes exists Recent activities have had little impact on ecological processes and conditions in the area

System road FDR 277B, used for administrative purposes, enters the area on the eastern side This road is visually evident and influences ecological processes, as a minimum, in the immediate vicinity of the road.

To what degree is the area natural or natural appearing and free from disturbance? Except for the recent timber harvest areas and wildlife improvements the area appears to be in a natural condition

U.S Navy fighter jets frequently make low level flights just to the west of the area, resulting in sudden noise impacts on the area Sounds of vehicles traveling on roads adjacent to the area can be heard in the northern, eastern, and southern portions of the area Switzer Lake on the northwestern border is a water supply reservoir for the City of Harrisonburg, Virginia. It has become a popular area for dispersed camping, picnicking and partying Noise from these activities can be heard in the northern portion of the area

If the area's ecological processes and/or natural appearance have been altered by past or present human activity, is the land regaining a natural, untrammeled appearance? Except for the areas of recent timber harvest, the area appears natural to the average visitor

Does the existing or attainable National Forest System ownership pattern, both surface and subsurface, ensure perpetuation of identified wilderness value? There are no apparent ownership patterns that would preclude perpetuation of wilderness values

Is more than 15 percent of the area in non-native vegetation? NO

Improvements, Structures, and Nonconforming Uses

Are any of the following types of areas, features or nonconforming uses present? If so, where?

Areas with evidence of historic mining at least 50 years old (Do not include areas of significant current mineral activity): NO

Areas under current mineral lease that contain a "no surface occupancy" stipulation: NO

Areas under current mineral lease where the leasee has not exercised development and occupancy rights: NO

Recreation improvements such as occupancy spots or minor hunting or outfitter camps: There are primitive, dispersed campsites scattered throughout the area

Timber harvest areas where logging and prior road construction are or are not evident: There are two timber harvest cutting units which have been logged since 1986 Although these units have revegetated, the harvest areas and associated roads and skid trails are visually evident

Some of the old access and logging roads built prior to government acquisition still exist These old roads are overgrown, but the roadways are still evident

Cultural treatments involving plantations or plantings: *About 20 acres have been site prepared since 1986* About 30 acres have been planted with white pine

Private inholdings in the area: NONE

Dwellings on private inholdings: NONE

Nonconforming structures and improvements· NONE

Ground-return telephone lines· NONE

Watershed treatment areas: NONE

Roads: The following Forest Service System Roads exist within the area FDR 227B enters the area from the eastern boundary and is 1 8 miles long It is closed to the public and used to access wildlife clearings for maintenance

In addition to FDR 227B there are a few old roads in the area that are not listed on the Forest's official transportation system These roads are popular ORV routes and are frequently, albeit illegally, travelled Illegal ORV and ATV use is well established within the area

ORV/ATV Use. There are no designated ORV/ATV trails in the Skidmore area Illegal use of ORVs and ATVs is prevalent throughout the area This established use will be extremely difficult to eliminate and will present a serious problem in terms of wilderness management In addition, a group of interested citizens have identified the northern portion of the Skidmore roadless area as part of a proposal for the development of ORV/ATV trail systems within the Geroge Washington National Forest

Can existing nonconforming uses be effectively mitigated or terminated through removal or rapid natural deterioration? It will be very difficult to eliminate illegal ATV/ORV use in the area FDR 227B will remain visually evident for years to come

Are improvements in the area being affected by the forces of nature rather than humans, and are they disappearing or muted? The harvested areas are being managed through follow-up site treatments with chainsaws to assure adaquate regeneration Wildlife clearings are mowed every other year Wildlife ponds receive maintenance to keep them functioning All of the above improvements are evident If left to the forces of nature, they would become muted and disappear over time

III EVALUATION

Capability

Does the area contain the basic characteristics that make it suitable for wilderness designation without regard to its availability for or need as wilderness? Consider the following characteristics in analyzing the quality of the wilderness resource. If these characteristics are determined to be important, describe and refer to them

Experiential benefits. Does the area provide the opportunity for solitude and serenity? The narrow width of the area, averaging 1 to 2 miles, and the roads adjacent to the north, east and south boundaries make it difficult to completely escape the sights and sounds of man. Within the area's interior, this is compensated for, in part, by the steep valley walls and high ridges which act as a buffer Sights and sounds from human activity along Highway 33, in Switzer Lake, and associated Forest Service Roads, Air Force and private lands on the borders are prevalent throughout most of the area Deep in the head of Skidmore Fork, little evidence of human activity is present and opportunities for solitude and serenity exist

Challenge. Does the area offer visitors the opportunity to experience adventure, excitement, challenge, initiative, or self-reliance Is access easy or difficult? Access to the area is provided off Forest Service system roads that border the area The area can be easily accessed

Challenges associated with travel in and through the area are minimized due to the area's relatively small size and narrow width With roads surrounding all but the eastern side, sounds of motorized vehicles will make it difficult to feel like one is really in the "wilderness "

None of the area is over 5 or 6 miles from a place of permanent human habitation

Outdoor Recreation Opportunities. What is the area's capability for providing primitive and unconfined types of recreation including

Camping - There are numerous primitive camping opportunities The sights and sounds of man will be prevalent in much of the area, detracting from the primitve quality of any camping experience

Hunting - The area is currently very popular for deer, bear, wild turkey and squirrel hunting

Fishing - There are no streams with sufficient flow to sustain a native trout population

Mountain Climbing - There are no known sites suitable for this activity

Ski Touring - This activity is suitable for the area, however snow fall is not sufficient to support ski-touring as a major activity A few local people may cross country ski as conditions permit

Canoeing - There are no streams or river large enough to support this activity

Boating - There are no streams or river large enough to support this activity

River Rafting - There are no streams or river large enough to support this activity

Backpacking - The area is excellent for backpacking Trips lasting a day or two are available

Hiking - The area contains a number of hiking trails The trail system is especially suited to day-trips into the area

Riding - Horse back riding could be encouraged, although most of the area is too steep and rocky to provide good riding opportunities. The current trail system would be suitable for trips of less than a day's duration

Photography - Virgin timber stands at the head of Skidmore drainage provide excellent opportunities for photography

Special Features

What is the area's capability to provide outdoor education and scientific study, both formal and informal, in a manner compatible with wilderness? Opportunities exist for studies and education on undisturbed Eastern hardwood, pine-oak, and oak-pine and hemlock forests All of the area can be easily reached in a day

Is there an abundant and varied wildlife population? The area supports black bear, white-tailed deer, wild turkey, squirrels and a number of other game and non-game species typical of Virginia's Appalachian region.

Due to its high elevation this area is rich in species that are typically found in more northerly locations Some are very rare occurrences for Virginia

It is believed that at one time the ridges around the area were subject to natural wildfires These fires may have created a park like habitat containing large, thick barked, widely scattered, older trees, with a grass and herbaceous ground cover Fires burned the light herbaceous fuels relatively frequently and eliminated seedlings, but overstory trees generally were not killed This area presently contains two species that inhabit such areas and are dependent on these high-elevation openings Ground juniper and the smooth green snake are found here Wildfires were rigorously suppressed in the past, and these species now exist primarily in man-created wildlife openings along the ridges

The old hemlock stands found in the upper drainages represent one of the best examples of undisturbed forested areas in the state and harbor several species of birds that are distinctly Canadian/boreal, including the red-brested nuthatch, golden-crowned kinglet, magnolia warbler, and brown creeper

The Cow Knob salamander, an endemic woodland salamander confined to Shenandoah Mountain, inhabits the higher elevations The best habitat is within the older mixed hardwood stands This species is considered "sensitive" on the forest, and is a candidate for federal listing as a threatened or endangered species pending additional information.

The red crossbill also inhabits the area, with the critical habitat element being yellow pine, particularly Table Mountain pine Table Mountain pine is best regenerated through the use of fire Red crossbills are considered to be very rare in Virginia

Rare woodland grasses include tall millet-grass and drooping bluegrass

The eastern woodrat lives in the small rocky ledges along the main drainage This species has declined drastically in the northern portion of its range, but appears to be stable on the Forest It is a candidate for federal listing

Peregrine falcons were "hacked" (raised and released) adjacent to the proposed wilderness boundary, and individuals are regularly seen in this area The Skidmore area should not be considered true peregrine habitat as it offers few, if any, cliffs, the peregrine's essential habitat element

A complete inventory of the area's flora and fauna has not been conducted

Manageability·

What are the characteristics of the surrounding area including ROS classification, adopted VQO, and present and planned uses? With the exception of a small piece of land on the western side of the area, the entire Skidmore area is surrounded by land with an ROS classification of roaded natural (RN) About 1 to 2 miles on the western boundary is adjacent to land with an ROS designation of semi-primitive, motorized (SPM) Except for the Skidmore Special Management area, all of the land within the area has been inventoried as RN The special management area has been administratively classified as semi-primitive, nonmotorized

The land surrounding the area on the southeastern and western sides has an assigned visual quality objective (VQO) of modification Lands bordering the northern end of the area, along U S Highway 33 have an assigned VQO of retention Lands along Switzer Lake have an assigned partial retention VQO The VQO for the Skidmore Special Management Area is preservation

Do boundary locations conflict with important existing or potential public uses outside the boundary that might result in demands to allow nonconforming structures and/or activities in the wilderness? Due to its shape, the Skidmore area would be very difficult to manage as wilderness At its widest point, Skidmore is only two and one-half miles wide At its narrowest point, it is *approximately three-fourths of a mile wide With roads surrounding three sides, the sights and sounds of motorized vehicles would* be prevalent throughout the area, except in the heart of the Skidmore Special Management Area (SMA) Highway 33, the northern boundary road is a major travel route between Virginia and West Virginia and receives a high volume of traffic on a year-round basis FDR 227, the eastern boundary road, provides ready access for ORV and ATV trespass, a problem that is already well established in the area Finally, there is a narrow sliver of private land that almost cuts the area in half, potentially degrading the integrity of the area from a wilderness standpoint

Skidmore also borders Switzer Lake, a reservoir for the City of Harrisonburg, Virginia If the reservoir were to be expanded in the future, the road providing access to Skidmore Fork (F D R 227) would have to be abandoned or moved further up slope into the area

Is it possible to readily and accurately describe, establish, and recognize boundaries on the ground? Yes The boundaries could be readily and accurately established on the ground The most difficult boundary to establish would be the western boundary that follows the Virginia/West Virginia boundary

Do boundaries, where possible, conform with terrain or other features that constitute a barrier to prohibited use? Boundaries follow roads and the top of Shenandoah Mountain The steep terrain partially limits access off boundary roads

Do boundaries, to the extent practicable, act as a shield to protect the wilderness environment inside the boundary from the sights and sounds of civilization? Due to the small size and narrow width of the area and the location of the boundary on open roads, the sights and sounds of human activity are fairly common within much of the area

Do boundaries provide adequate opportunities for access and traveler transfer facilities? YES

<u>Availability</u>

Describe other (nonwilderness) resource demands and uses.

Recreation - The interior region is used mainly for hunting The boundary area is used for dispersed camping Hiking, horesback riding, and mountain bike riding use is increasing in the area Illegal use of ATVs is also increasing

Information on Wildlife Species, Populations, and Management Needs - The area contains game and non-game species commonly found in the Mid-Appalachians as well as the sensitive species described earlier Many popular game species would benefit from habitat manipulation in the mature forest's canopy The 5,630 acres in Skidmore represent 2 and one-half percent of the Dry River district and one-half of 1 (0 5) percent of the George Washignton National Forest

Water Availability and Use - In the lower elevations, water is available in small streams, except for the driest times of the year In the higher elevations, seeps and scattered springs are the only water sources

Water in the streams is not safe for human consumption since it may contain various aquatic parasites that cause distress to humans. Water taken directly from springs and seeps may not contain these aquatic parasites. The eastern portion of the area forms part of the municipal watershed for the City of Harrisonburg Switzer Lake, just on the border of the area is the water impoundment for the City of Harrisonburg

Livestock Operations - No grazing is permitted in the area

Timber - The area contains good quality sawtimber in the lower drainages Some of the driest slopes contain pine pulpwood Much of the remainder of the area contains stands of small, low quality hardwoods which, if marketed, could help to meet the local demand for firewood

Based on data in the Continuous Inventory of Stand Conditions (CISC) data base that was used in the existing forest plan, there are approximately 2,550 acres of suitable forest land in the Skidmore area This amounts to approximately 45 percent of the area's total acreage

Minerals - The mineral potential of the area is not fully known There is no indication that the area has potential for mineral development To date, little interest has been shown for any activity other than leasing for oil and gas exploration No leases exist within the area and no active exploration has taken place

Cultural Resources - This area contains a limited amount of land on which one would discover prehistoric or historic sites Virtually all of the potential inhabitable land is located in the Skidmore Fork Valley, from the area boundary, southwest to an elevation of approximately 3000' ASL This terrain is relatively flat, with access to water, and offers landforms that could have been used by both prehistoric and historic inhabitants One would expect historical farmsteads and/or cabin sites to be located along this drainage Prehistoric sites would be located along the flood plain and/or terraces formed along the stream Stream channel scouring and/or the deposition of flood-carried debris may have removed or covered sites that existed on the lower flood plains or terraces

The lands surrounding the stream valley has a very limited potential to contain historic or prehistoric sites Most of the terrain consists of steeply sloping ridges or hollows that would not have been a favored area for occupations

Ridges that are relatively flat within the area offer the only possibility for occupation If there were unique resources (which is doubtful) or if a perennial spring was located near the portions of these flats, there would exist a possibility for prehistoric occupation

Authorized and Potential Land Uses. The Skidmore area lies within the proposed Skidmore Special Biological Area (SBA) The potential SBA, containing approximately 2,080 acres, has been proposed for designation by the Virginia Department of Conservation and Recreation, Division of Natural Heritage There are no permanent occupancy uses currently authorized and none are anticipated in the future

Management Considerations Including Fire, Insects and Diseases, and Presence of Non-Federal Lands. The area will probably be defoliated by the gypsy moth within the next 5 years The Southern pine beetle is currently endemic, but populations are building yearly

There have been no large, human-caused fires recently One lightening fire occurred near Switzer Lake, just outside the boundary

Wilderness designation could make fire suppression more difficult in some cases, as mechanized suppression equipment is not allowed in the wilderness under most circumstances Because wildfire has been aggressively suppressed since government aquisition of the land, fuel loadings are relatively high If substantial forest mortality occurrs as a result of the gypsy moth or Southern pine beetle, this could result in even higher fuel loadings

What outputs are currently produced or could be produced in the future? The area provides good opportunities for hunting, especially for deer, bear, turkey and squirrel

The area contains some good quality hardwood sawtimber and pine pulpwood and an abundance of hardwood fuelwood

Is the area located such that the need for increased water production and/or additional onsite storage is so vital that installation or maintenance of improvements is an obvious and inevitable public necessity? No, the area is not located such that it is in an area that is, at the present time, vital to the water needs of the public Switzer Lake, an existing reservoir on the north east boundary of the area, provides water for the City of Harrisonburg If it ever became necessary to increase the size of this reservoir, a portion of the area along the northeastern boundary would be affected

Would wilderness designation seriously restrict or prevent the application of wildlife and/or threatened and endangered plant or animal management measures of considerable magnitude and importance? No, but some popular game species in the area would benefit from habitat manipulation such as timber harvest to create openings in the canopy and/or prescribed burning

Is it a highly mineralized area of such strategic or economic importance and extent that restrictions or controls due to wilderness designation would not be in the public interest? NO

Does the area contain natural phenomena of such unique or outstanding nature that general public access and special development to facilitate public enjoyment should be available? NO

Is the land needed to meet clearly documented resource demands such as for timber, mineral production, or developed recreation? NO

Is the land committed through contractual agreements for use, purposes, or activities not in concert with wilderness requirements? NO

Need

Other Wildernesses·

How far is it to the closest existing wilderness? Skidmore is approximately 11 miles from the north end of Ramseys Draft Wilderness

What level of use currently exists in near-by existing wilderness? What trends exist in the use of these areas? According to Recreation Information Management (RIM) use records from 1989, there were a total of 3,100 recreation visitor days of use in Ramseys Draft. Trends indicate a steady increase in use of the area. Impacts from recreation use are starting to show up at a few campsites along Ramseys Draft and inside the Wilderness close to the trailhead at Mountain House recreation area

Is the population in and around these areas increasing or decreasing? How quickly is it increasing or decreasing? The Skidmore area is in Rockingham county, Virginia Rockingham county's population increased from 57,038 to 67,133 people at an annual rate of 0 7 percent between the years 1980 and 1990 In Augusta county to the south, the population increased at an annual rate of 0 5 percent, from 53,732 to 56,315 between 1980 and 1990 In Shenandoah county to the north, there was an increase in population from 27,559 to 30,322 between 1980 and 1990, an annual percentage increase of 1 0 percent

To the west, the population in Pendleton county, West Virginia increased from 7,910 to 7,997, a 0 1 percent annual increase between 1980 and 1990

Within the state of Virginia, the population increased at an annual rate of 1 4 percent between 1980 and 1990 This figure becomes significant in light of the fact that many of Virginia's wilderness users travel a considerable distance User surveys conducted in the St Marys wilderness indicate that a third of all visitors traveled over 100 miles to visit the area

Nonwilderness lands.

Are there opportunities for unconfined and primitive recreation experiences on nonwilderness areas in the vicinity? If so, where? Many acres of National Forest Land that join this area on the north, east and south of Shenandoah Mountain provide primitive recreation experiences

Habitat.

Are there any biotic species in the area that are directly competing with increasing public use and development? Recent interest in the biotic species of the high elevations of the Southern Appalacians has revealed that some plant and animal species found in the high elevations are unique Some of these species are known to exist on and near the top of Shenandoah Mountain A complete inventory of the rare flora and fauna has not been completed The Virginia Division of Natural Heritage has identified several species of special concern in the Skidmore area These are listed below

Scientific Name	*Common Name*
Plethodon puctatus	Cow Knob salamander
Poa languida	drooping bluegrass
Milium effusum	tall millet-grass
Juniperus communis	ground juniper
Certhis familiaris	brown creeper
Dendroica magnolia	magnolia warbler
Loxia curvirostrata	red crossbill
Opheodrys vernalis	smooth green snake
Regulus satrapa	golden-crowned kinglet
Sitta canadensis	red-breasted nuthatch

Four of these species, the drooping bluegrass, tall millet-grass, ground juniper, and red crossbill are ranked by the Division of Natural Heritage as being critically imperiled in Virginia The Cow Knob salamander, magnolia warbler, golden-crowned kinglet, and red-breasted nuthatch are ranked as imperiled in Virginia, and the brown creeper and smooth green snake are ranked as being rare in Virginia. With the exception of the Cow Knob salamander and the drooping bluegrass, all other species are ranked as being demonstrably secure on a global scale

The Cow Knob salamander is a candidate for federal listing but a final determination has not been made at this time

According to the Division of Natural Heritage, threats to the species listed above include "logging, road construction/expansion, intensive recreational development, and pesticide spraying The area should be left in its natural state, and rare species populations monitored periodically Forest ecology research should be encouraged at the old growth forest "

For protection purposes, the Heritage Program recommends the elimination of "threat factors," and the establishment of Research Natural Area boundaries

If active habitat management is determined to be desirable or necessary for any identified rare or sensitive species, wilderness designation might preclude or make such efforts more difficult

The demand for motorized recreation opportunities and developed recreation sites on the Dry River District is increasing The demand for permitted special use events is also increasing While there are areas outside Skidmore that could be developed to satisfy these demands, these activities directly compete with wildlife species, such as bear and turkey, that require remote habitat to thrive

With the increased demand for all types of activities on the Forest, the unique biotic species found in the higher elevations of Shenandoah Mountain become increasingly more vulnerable to disturbance from humans

Could their needs be provided for through means other than wilderness designation? Yes The needs of unique, sensitive, threatened and/or endangered species could be met through establishment of Research Natural Areas, Special Management Areas, or by allocating the area to other management prescriptions that would afford protection for these species

The George Washington National Forest is cooperating with the U S Fish and Wildlife Service in developing a conservation strategy for the Cow Knob salamander in the form of a pre-listing recovery plan This plan will specify standards by which the area will be managed to ensure the viability and long conservation of this species

Is there a need to provide a sanctuary for biotic species that cannot survive in less than primitive surroundings? Several rare species have recently been identified in this area Studies and data collection are being conducted at this time to determine the habitat needs of these species

George Washington National Forest
Lee Ranger District

SOUTHERN MASSANUTTEN ROADLESS AREA

Scale

1:126,720
1/2 inch = 1 mile

N

Roadless Area

SOUTHERN MASSANUTTEN ROADLESS AREA

I DESCRIPTION

Acres· approximately 11,919

Location and vicinity. Southern Massanutten is located on the Lee River Ranger District, George Washington National Forest Southern Massanutten lies at the southern end of the Massanutten Mountain chain and includes all the National Forest land from Pitt Springs road south to Harshberger Gap and east to the Cub Run Road It is located in two counties of Virginia Page and Rockingham The northern end of Southern Massanutten is about 12 miles southwest of Luray, VA The southern end is about 8 miles east of Harrisonburg, VA

Describe access to the area including roads and trails leading to the area Southern Massanutten is bounded on the east by Forest Development Road (FDR) 65 and on the northeast by FDR 375 It can also be accessed by Virginia Routes 601, 636, 644 and 620 and Forest Service Road 1613

Southern Massanutten is bisected by the Massanutten Mountain South (MMS) trail Several sidetrails from public roads and trailhead parking lots tie into the MMS trail (see maps) making many loop hikes of varying length and difficulty possible MMS from Pitt Springs to Fridley Gap was a jeep road 20 years ago The portion from Pitt Springs to the crossing of Morgan Run is still usuable by 4x4 vehicles, however it has been closed to public use for about 12 years It has been used administratively to access several wildlife openings and ponds, to maintain the trail, and for law enforcement purposes connected with illegal ATV and motorcycle use Forest Service Road 1613 is located on a good easement and provides access to trailhead parking in Fridley Gap Both the Cub Run and Pitt Springs road are used as a boundary for the area as proposed

General description of the area's geography The Southern Massanutten Roadless Area lies along the southern end of the Massanutten Mountain chain which lies between the North and South Forks of the Shenandoah River and separates the main Shenandoah Valley on the North Fork from the Page Valley on the South Fork This area is part of the Ridge and Valley Physiographic Province

General description of the area's topography The Massanutten Mountain chain in this vicinity is made of four main ridges that lie in a slightly southwest to northeast orientation Southern Massanutten includes First, Second, Third, and Fourth Mountains These main ridges are cut by several water gaps that cut through the various ridges and drain to the east and west Southern Massanutten includes both ridgetops and streambottoms Elevations range from 1,181 near Catherine Furnace to almost 3,200 feet at Grubbs Knob

General description of the area's vegetation, including the ecosystem type Southern Massanutten lies in the temperate, eastern deciduous forest zone of North America The vegetation is typical of mountain ridgetops within the Masanutten Mountains There are many rock outcroppings and cliffs Blockfields are common Vegetation on the ridge sites includes bear oak, laurel, and mixed stands of gnarly chesnut oak and Table Mountain or pitch pine The more fertile sites on the lower slopes have a representation of white oak and some of the wider stream bottoms have a narrow stringer containing a few northern red oak The Easter ice storm of 1978 heavily damaged stands located on east aspects and resulted in understories that have a high oak component

Key attractions, if any, including sensitive wildlife and scenic landmarks. Southern Massanutten includes Pitt Springs, a bold spring, Morgan Knob, Grubbs Knob, and some scenic streamcourses such as Boones Run and Morgan Run The old site of Pitt Springs Lookout is within Southern Massanutten There is much evidence of the old iron ore mines that were utilized during the charcoal iron days of the 1800s

II. INVENTORY

Human Influence

To what degree have humans and past and present human activity affected natural ecological processes and conditions? Southern Massanutten displays past evidence of man's presence Most of the area was cutover for charcoal to fuel Catherine Furnace and for tanbark There are a number of old roads and skidtrails dating from this period The majority of the forest stands in the area are approximately 80 years old The area burned frequently prior to government acquisition

The technical examination report of the lands of Allegheny Ore and Iron done in 1912 provides an indication of the history of the Southern Massanutten Roadless Area These lands compose all but the extreme southern end of the roadless area Portions of this report on Southern Massanutten are presented below

" there has been hardly a month, contractors were not engaged in getting out whatever merchantable products could be found, timber, staves, ties and bark have been cut The present stand of timber is so scattered that sufficient timber for a portable mill operation cannot be found in one place The tract has not been protected, and has been burned repeatedly On the ridges and upper slopes, fires have prevented satisfactory re-stocking "

"At present the forest consists, for the most part, of second growth There is practically no mature timber left, except a very few culled patches of 5 or 10 acres, or less, where for one reason or another , a clear cutting was not made "

"Because of the keen demand for chestnut bark, this product has been almost entirely removed for the tract It has even proved profitable to cut trees for bark, which has a breast height diameter of only 5 or 6 inches "

To what degree is the area natural or natural appearing and free from disturbance? Southern Massanutten has recovered from the conditions of 1911 due to protection from fire and minimal subsequent intrusion by man The area appears to the average visitor as quite natural and free from disturbance by man There are several clearcuts, cut within the last 20 years, along the Cub Run Road that are quite evident There are numerous old roads, skid trails, mine scars and charcoal hearths scattered throughout the area which are detectable by keen observers These add historical interest to many users and do not necessarily detract from wilderness values

The sight and sound of man's activities are evident from most of Southern Massanutten due to views of adjoining private land and the short distance from major State roads

If the area's ecological processes and/or natural appearance have been altered by past or present human activity, is the land regaining a natural, untrammeled appearance? Southern Massanutten has a natural and untrammeled appearance to the average visitor

Does the existing or attainable National Forest System ownership pattern, both surface and subsurface, ensure perpetuation of identified wilderness value? All of the surface resources in the Southern Massanutten Roadless Area are owned by the federal government

8,360 acres of the Southern Massanutten Roadless Area (from Boone Run north) has reserved mineral rights

Is more than 15 percent of the area in non-native vegetation? NO

Improvements, Structures, and Nonconforming Uses

Are any of the following types of areas, features or nonconforming uses present? If so, where?

Areas with evidence of historic mining at least 50 years old (Do not include areas of significant current mineral activity) There are some old open-cut mines around Pitt Springs There are also numerous charcoal hearths scattered throughout the area All are covered with leaf litter and vegetation and would not negatively impact the wilderness resource

Areas under current mineral lease that contain a "no surface occupancy" stipulation· NONE

Areas under current mineral lease where the leasee has not exercised development and occupancy rights. NONE

Recreation improvements such as occupancy spots or minor hunting or outfitter camps· There are no outfitter camps The only "occupancy spots" primitive dispersed camping locations

Timber harvest areas where logging and prior road construction are or are not evident Some of the old charcoal, tanbark, and log skidtrails and roads are evident to the keen observer Most are overgrown and do not detract from the primitive experience The clearcuts along the Cub Run Road that have been done within the last 20 years and are clearly evident

Cultural treatments involving plantations or plantings. There are two stands that were treated with herbicide in the late 60s These have responded with new growth and the average visitor does not recognize that any unnatural activity has occurred

Private inholdings in the area: NONE However, the Massanutten Village resort community surrounds the southern projection of National Forest on First Mountain

Dwellings on private inholdings· NONE Many houses are located along the property line adjoining Massanutten Village

Nonconforming structures and improvements· There are none within the area, however, there are several sites on private land very close to the boundary

Ground-return telephone lines· NONE

Watershed treatment areas. Two small areas have been recently treated One is a borrow pit in Fridley Gap and the other is a shale pit just north of Pitt Springs

Roads· Old wagon roads throughout Southern Massanutten are used as non-motorized trails, including most of the MMS trail These old roads are not visually intrusive and present no negative impact if the area were to be designated as wilderness There are several short roads from the Cub Run Road into Southern Massanutten that serve widlife openings and/or were used for the recent clearcuts

Can existing nonconforming uses be effectively mitigated or terminated through removal or rapid natural deterioration? YES

Are improvements in the area being affected by the forces of nature rather than humans, and are they disappearing or muted? The only improvement within the area is a trail shelter in Boones Run which is being maintained by a trail club The shelter is government owned

III. EVALUATION

Capability

Does the area contain the basic characteristics that make it suitable for wilderness designation without regard to its availability for or need as wilderness? Consider the following characteristics in analyzing the quality of the wilderness resource. If these characteristics are determined to be important, describe and refer to them.

Experiential benefits. Does that area provide the opportunity for solitude and serenity? There are limited opportunities for solitude and serenity primarily in the area's interior The narrow width of the area and its location along the top of a mountain allow sights and sounds of man to be heard and seen in much of the area

Challenge. Does the area offer visitors the opportunity to experience adventure, excitement, challenge, initiative, or self-reliance Is access easy or difficult? The area is easily accessible by trails The area is too narrow to permit much of a sense of adventure and excitement and feeling of being self-reliant and using one's initiative

Outdoor Recreation Opportunities What is the area's capability for providing primitive and unconfined types of recreation including

Camping - The area has many opportunities for primitive camping

Hunting - The area is popular for deer, bear, grouse and turkey hunting

Fishing - Part of Boones Run and Pitts Springs Creek contains native trout

Mountain Climbing - NONE

Ski Touring - NONE

Canoeing - NONE

Boating - NONE

River Rafting - NONE

Backpacking - There is an excellent trail system in place

Hiking - There is an excellent trail system in place

Riding - The area is heavily used for horseback and mountain bike riding

Photography - There are good opportunities for photography

Special Features

What is the area's capability to provide outdoor education and scientific study, both formal and informal, in a manner compatible with wilderness? The area is close to large numbers of people and is easily accessed by road and trail. This would allow educational activities to take place

Is there an abundant and varied wildlife population? The area supports bear, deer, grouse and turkey plus non-game species typical of the Massanuttens

Manageability:

What are the characteristics of the surrounding area including ROS classification, adopted VQO, and present and planned uses? The western and southeastern boundary of the area consists of private land The surrounding area is predominately inventoried as roaded natural ROS although there are some semi-primitive, motorized ROS areas The visual quality objective for the surrounding area is predominately partial retention although there is some retention and modification

Do boundary locations conflict with important existing or potential public uses outside the boundary that might result in demands to allow nonconforming structures and/or activities in the wilderness? There are no known conflicts There are several places along the boundary between private and National Forest that now have or will have private structures located against the property line This is especially true along First Mountain where it points south into Harshberger Gap Private land on both sides of the mountain is within the Massanutten Village resort area Permanent residences are located along the property line in many locations

Southern Massanutten could be more effectively managed with some minor boundary adjustments to exclude the extreme southern end of First Mountain and five tracts on the west side that jut into private land

Is it possible to readily and accurately describe, establish, and recognize boundaries on the ground? The boundary follows private property lines or existing roads except for a short section at the extreme northern end of the area These boundaries can be acurately described and recognized

Do boundaries, where possible, conform with terrain or other features that constitute a barrier to prohibited use? NO The boundaries follow the Pitt Springs and Cub Run Roads and the private/National Forest property lines Both the roads and the property lines do not form a barrier to prohibited use

Do boundaries, to the extent practicable, act as a shield to protect the wilderness environment inside the boundary from the sights and sounds of civilization? NO Southern Massanutten is narrow with much of boundary consisting of roads and private/ national forest property lines There is no way the sights and sounds of civilization can be shielded from the area

Do boundaries provide adequate opportunity for access and traveler transfer facilities? Minor adjustments are needed in the Fridley Gap area to allow an existing trailhead and a short stretch of road providing access to remain

Availability

Describe other (nonwilderness) resource demands and uses

Recreation - Southern Massanutten is now used for hiking, horseback riding, mountainbike riding, and hunting It is heavily hunted for deer, turkey, and small game Bear hunting with dogs is a traditional use of Southern Massanutten Boones Run trail shelter receives moderate use

Information on Wildlife Species, Populations, and Management Needs - Deer, grouse and bear populations are average for the Massanuttens Terrain and vegetation do not favor turkey within the area proper excepting the lower slopes along the Cub Run Road Adjoining National Forest land to the east is favorable turkey habitat

Water Availability and Use - NONE

Livestock Operations - NONE

Timber - There is some suitable acreage along the Cub Run Road which could be managed in a cost effective manner due to the existing access road There is a high demand for firewood in the area and personal use firewood gathering along the existing roads is a long time established use of the area

Minerals - There are no active federal mineral leases and no anticipated demand for federal minerals Although mineral potential is considered low, private mineral owners may seek to exercise their development rights

Cultural Resources - There are no identified significant archaelogical sites in Big Schloss Several small lithic scatters or transient campsites have been discovered during general cultural inventories of Big Schloss

The old iron ore diggings and the site of the lookout are interesting and add to the character of the area There was a "cable road" that ran from Fridley Gap to just west of Peterfish Gap Part of the Fridley Gap trail is on the location of this cable road

Authorized and Potential Land Uses - NONE

Management Considerations Including Fire, Insects and Diseases, and Presence of Non-Federal Lands - Gypsy moth defoilated Southern Massanutten last year and will probably do so for another few years before their population crashes There may be castrophic fires in the next 50 years due to the build up of fuels over the past 50 to 70 years and the breakup of the older, even-age forest by gypsy moth, disease, and natural phenomena and the increased chance of starts due to human settlement along the property line

What outputs are currently produced or could be produced in the future? Southern Massanutten presently serves as good bear habitat which could be enhanced through habitat manipulation to create permanent or temporary openings and waterholes and through prescribed burning Grouse and deer hunting will continue Personal use firewood cutting could be sustained in perpetuity along the lower slopes of Cub Run Road

Is the area located such that the need for increased water production and/or additional onsite storage is so vital that installation or maintenance of improvements is an obvious and inevitable public necessity? NO

Would wilderness designation seriously restrict or prevent the application of wildlife and/or threatened and endangered plant or animal management measures of considerable magnitude and importance? NO

Is it a highly mineralized area of such strategic or economic importance and extent that restrictions or controls due to wilderness designation would not be in the public interest? NO

Does the area contain natural phenomena of such unique or outstanding nature that general public access and special development to facilitate public enjoyment should be available? NO

***Is the land needed to meet clearly documented resource demands such as for timber, mineral production, or developed* recreation?** NO

Is the land committed through contractual agreements for use, purposes, or activities not in concert with wilderness requirements? NO

Need

Other Wildernesses:

How far is it to the closest existing wilderness? There are 82,260 acres of wilderness in Shenandoah National Park The closest of these existing wilderness areas is about 5 miles to the east of this area

What level of use currently exists in near-by existing wilderness? What trends exist in the use of these areas? The wilderness areas in the Shenandoah National Park receive high use and the trend is steady since 1981 according to SNP officials

Is the population in and around these areas increasing or decreasing? How quickly is it increasing or decreasing? The population is increasing moderately in the local area The regional area, which includes the D C metro area, is increasing as a moderate to high rate

Studies of visitors to the St Marys wilderness on the Pedlar Ranger District have indicated that the visitors often travel up to 100 miles to get to the area In light of this, it is useful to look at the population of the states of Virginia and West Virginia Between 1980 and 1990, the population of the State of Virginia increased at an annual rate of 1 4 percent while the population for the state of West Virginia decreased at an annual rate of 0 4 percent

Nonwilderness lands:

Are there opportunities for unconfined and primitive recreation experiences on nonwilderness areas in the vicinity? If so, where? There are many locations on National Forest that join this area on the northwest and on the south within the Massanutten Mountain range that provide opportunities for primitive recreation Shenandoah National Park lies just to the east The entire west side of the Lee District lies just across the Shenandoah Valley

Habitat:

Are there any biotic species in the area that are directly competing with increasing public use and development? A survey for rare flora and fauna in Southern Massanutten has not been completed At this time, there are no known biotic species in Southern Massanutten that are directly competing with increasing public use and development

Could their needs be provided for through means other than wilderness designation? NOT APPLICABLE

Is there a need to provide a sanctuary for biotic species that cannot survive in less than primitive surroundings? There is not a need to provide a sanctuary for biotic species that cannot survive in less than primitive surroundings

George Washington National Forest
Pedlar Ranger District

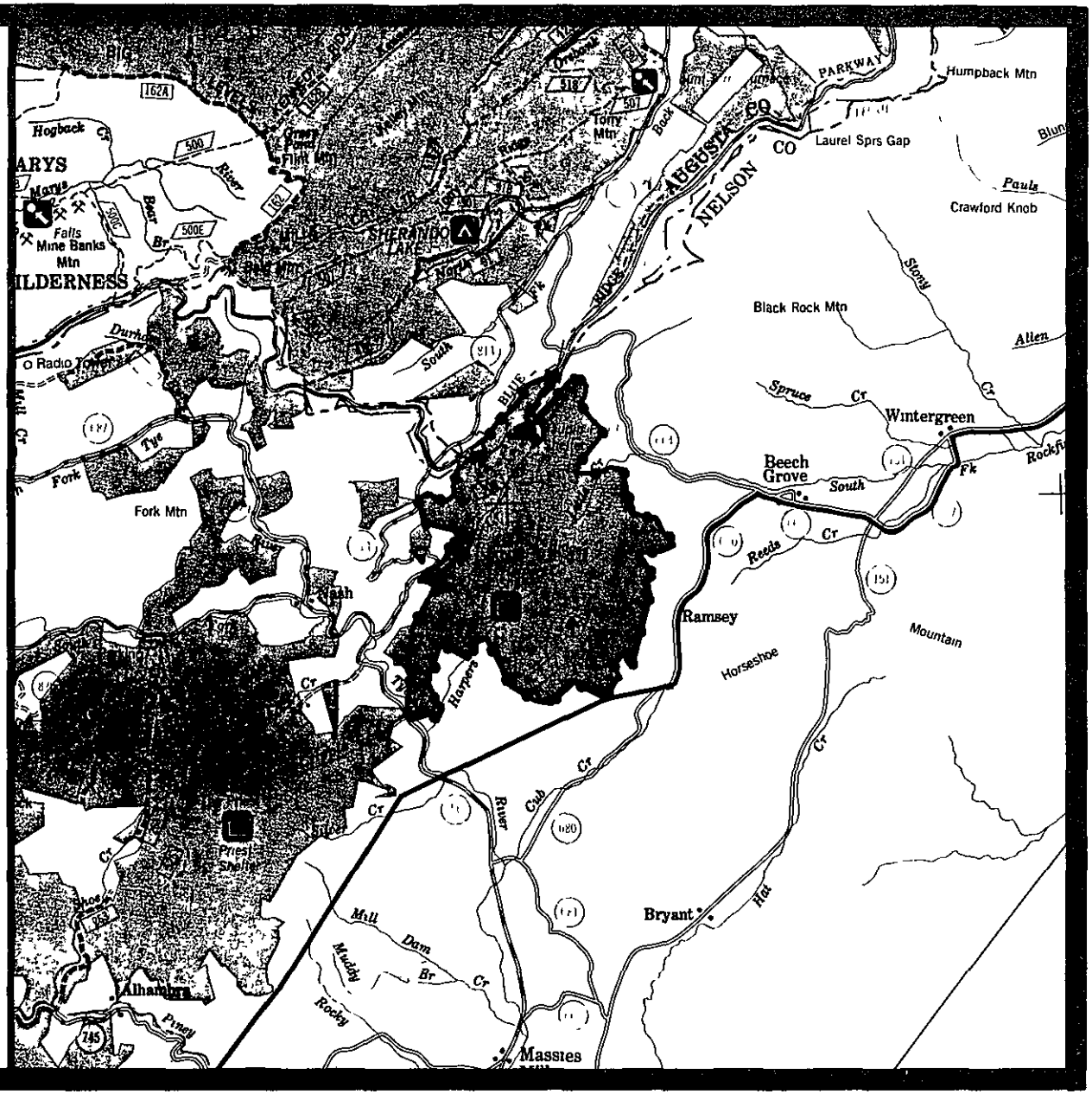
THREE RIDGES ROADLESS AREA

Scale

1:126,720

1/2 inch = 1 mile

Roadless Area



THREE RIDGES ROADLESS AREA

I. DESCRIPTION

Acres· approximately 4,702

Location and vicinity. The area named Three Ridges is the major northern topographic feature located on the Pedlar Ranger District, George Washington National Forest, east of the Blue Ridge Parkway, Nelson and Augusta counties, Virginia It includes consolidated NF ownership between SR 814 (west side), Tye River (adjacent to SR 56, south side), SR 680 (east side), and the Blue Ridge Parkway and SR 664 (north side). All small tracts within this area which are separated from the solid ownership are excluded Lands recently acquired through the Dorgan Exchange (Tract 1422) and the expected transfer of the Campbell Tract (No 450-03) from the Park Service is included Only that very small portion between the Nelson County Line and Blue Ridge Parkway Boundary is within Augusta County, Virginia

Describe access to the area including roads and trails leading to the area. Access to the exterior of the area is provided on those roads noted above Direct access to the boundary is possible by several private farm roads, FDR 306, SR 682, and the Appalachian National Scenic Trail

General description of area geography. The Three Ridges area is underlain by a great diversity of rock types that owe their origin to a wide variety of sedimentary, igneous and metamorphic processes Resting atop the Blue Ridge Complex, called the Blue Ridge-Catoctin Mountain anticlinerium, is a sequence of Cambrian volcanic and sedimentary rocks Soils are from the Haysville-Porters-Lew and Parker-Edneytown Associations

General description of area topography The area encompasses the very rugged and steep Three Ridges range of mountains along the crest of the Blue Ridge Elevations range from about 1,000 feet to the highest point of 3,970 feet above sea level The general topographic pattern is steep undulating ridges with deep "V" shaped hollows Large rock outcrops are common throughout the area Most of the streams were partially scoured during floods resulting from Hurricane Camille in August 1969 Landslides which occurred during the hurricane have partially healed, except those which eroded to bedrock Water from Campbell Creek flows into the North Fork of the Tye River, Harpers Creek flows into the Tye River, and Little Creek and Reeds Creek are tributaries of Rockfish River Final distribution is into the James River Basin of the Middle Atlantic Drainage Area

General description of area vegetation, including the ecosystem type. The area is entirely forested with species associated with the Eastern Deciduous Forest characteristic of the Blue Ridge Chain of the Appalachian Mountain System Chestnut and scarlet oak predominate on the dry, rocky ridges and slopes Mixtures of northern red oak, white oak, hickory, white ash, red maple, black cherry, black oak, Virginia pine, white pine, pitch pine, black locust, and some black walnut are scattered in the overstory and understory Cove hardwood species, such as yellow poplar, sugar maple, basswood, ash, birch and hemlock, prevail on the lower and moist sites Mountain laurel is also abundant in the lower understory, along with dogwood, grape, and rhododendron Coral berry and honeysuckle form some of the dense ground cover in the old fields and orchards Remnant apple trees persist in the old orchards and home sites, along with persimmon, sassafras, locust, and southern pine

Key attractions, if any, including sensitive wildlife and scenic landmarks. Three Ridges contains some of the most spectacular mountain scenery in Virginia The Appalachian National Scenic Trail provides interior access to very rugged terrain with rock cliffs and chimneys Sight distance from the Appalachian Trail is restricted due to the closed vegetative canopy, however, spur trails to overlooks, rock outcrops, and waterfalls provide magnificent views of the Shenandoah, Rockfish, and Tye River Valleys Views of the area from travel routes are limited and are typically from great distances outside the area

The swinging bridge on the AT, located just outside the boundary, across the Tye River is considered to be quite unusual and somewhat special AT hikers rate the northbound climb from Harper's Creek shelter to the top of Three Ridges as one of the steepest and toughest along the entire trail Because of the mature condition of the forest, there are many very large hardwood trees on the lower, moist sites Hairy rockcress, a very rare plant in Virginia inhabits Three Ridges

II INVENTORY

Human Influence

To what degree have humans and past and present human activity affected natural ecological processes and conditions? Settlement of this mountainous region by the white man began as early as 1788 Conditions during the Civil War and the subsequent Period of Reconstruction greatly influenced landownership and use Many of the early settlers were unable to cope with new tax laws, lack of currency and poor transportation and consequently many farms were sold and/or abandoned

In 1911, Congress authorized the purchase of forest land in the East to protect the headwaters of navigable streams Many of the lands purchased contained timber reservations lasting from 7 to 10 years Execution of these reservations, the devastation of the American Chestnut by blight, and the frequent forest fires interacted to create the forest resources which exist today Limited recent activities include those associated with the Appalachian Trail and fire suppression The area has been essentially under custodial management since government acquisition

To what degree is the area natural or natural appearing and free from disturbance? Little evidence of turn-of-the-century activities are evident to the casual visitor Timber stand improvement on 176 acres was performed in 1961 Wildlife habitat improvements, such as pruning, planting, spring (water) improvements, and cutting of black locust, was accomplished in the early 1970s The very limited number of old skid trails and haul roads have grown over with vegetation and are now healed Activities in association with the Appalachian Trail and five old home sites are visually evident The home sites are actively maintained as wildlife key areas and were last maintained between 1983 and 1985 There are periodic improvements and maintenance to the Maupin Field and Harpers Creek Shelters and to the AT and its associated side trails Because of the rugged terrain and lack of access, there is no record of any timber sale harvest in the Three Ridges Area The last fire was caused by lightning in 1986 and was 20 acres in size

If the area's ecological processes and/or natural appearance have been altered by past or present human activity, is the land regaining a natural, untrammeled appearance? The area appears very natural

Does the existing or attainable National Forest System ownership pattern, both surface and subsurface, ensure perpetuation of identified wilderness value? There are no apparent ownership patterns that would preclude perpetuation of wilderness values

Is more than 15 percent of the area in non-native vegetation? NO

<u>Improvements, Structures, and Nonconforming Uses</u>

Are any of the following types of areas, features or nonconforming uses present? If so, where?

Areas with evidence of historic mining at least 50 years old (Do not include areas of significant current mineral activity) NONE

Areas under current mineral lease that contain a "no surface occupancy" stipulation. NONE

Areas under current mineral lease where the lessee has not exercised development and occupancy rights NONE

Recreation improvements such as occupancy spots or minor hunting or outfitter camps The Maupin Field and Harpers Creek Appalachian Trail shelters are located within the area A picnic table, fire grill, and pit toilet are present at each shelter Primitive, dispersed camping sites are scattered throughout the area, but are inconspicuous Directional signs are evident along the trails

Timber harvest areas where logging and prior road construction are or are not evident: Old roads have become overgrown but are only evident to the keen observer Because of the very rugged terrain, access and other unsuitable timber management conditions, there are no noticeable timber harvest areas

Cultural treatments involving plantations or plantings· The limited degree of timber stand and wildlife habitat improvement activities are not evident

Private inholdings in the area: NONE

Dwellings on private inholdings· NOT APPLICABLE

Nonconforming structures and improvements. Two Appalachian Trail shelters with a picnic table, fire grill, and pit toilet are within the area

Ground-return telephone lines. NONE KNOWN

Watershed treatment areas· NONE

Roads: FDR 306 enters the area from the Blue Ridge Parkway to the Maupin Field shelter for a distance of 1 25 miles It is currently maintained to D-level standards

ORV/ATV Use: *ORV and ATV use in the area is limited There are currently no trails designated for ORV/ATV use None of Three* Ridges is suitable for the development of an ORV/ATV trail system

Can existing nonconforming uses be effectively mitigated or terminated through removal or rapid natural deterioration? The Appalachian Trail's purpose and character are primitive in nature and generally consistent with the management of areas as wilderness The AT and its related structures represent a desirable existing use that provides for visitor health and safety Traditional trail-marking and footpath maintenance should continue Mechanized or motorized tools would not be used for maintenance, except as expressly allowed within appropriate legislation

Are improvements in the area being affected by the forces of nature rather than humans, and are they disappearing or muted? The trail, trail shelters and FDR 301 are currently being maintained for long-term needs and are visually evident

III. EVALUATION

Capability

Does the area contain the basic characteristics that make it suitable for wilderness designation without regard to its availability for or need as wilderness? Consider the following characteristics in analyzing the quality of the wilderness resource. If these characteristics are determined to be important, describe and refer to them

Experiential benefits. Does the area provide the opportunity for solitude and serenity? There are some tremendous opportunities in Three Ridges to experience solitude and serenity, although hikers frequent the Appalachian Trail and shelter sites Private land developments are visible in the distance from some of the overlooks

Challenge. Does the area offer visitors the opportunity to experience adventure, excitement, challenge, initiative, or self-reliance Is access easy or difficult? Access is provided on the Appalachian Trail This particular section of the Trail features a climb of over 3,000 feet over a distance of approximately five miles and is considered to be among the most challenging sections along the entire trail Away from the trail, the rugged terrain offers ample opportunity for adventure and challenges Cross-country foot travel would be dangerous and difficult for the novice

Outdoor Recreation Opportunities. What is the area's capability for providing primitive and unconfined types of recreation including:

Camping - Despite the rugged terrain, there are numerous locations for primitive camping

Hunting - This activity is readily available for some small and large game species, however, use doesn't appear to be very high because of limited motorized access and the rough terrain

Fishing - Harpers and Campbell Creeks are listed as Class II streams for wild trout However, these fisheries provide very limited opportunities inside the Three Ridges Area These streams are classed as sensitive to acidic deposition

Mountain Climbing - Some suitable terrain is available

Ski Touring - This activity is not practical because of the limited quantity of snow and lack of suitable routes

Canoeing - There are no rivers or streams large enough to support this activity

Boating - There are no rivers or streams large enough to support this activity

River Rafting - There are no rivers or streams large enough to support this activity

Backpacking - The area is excellent for the resident and through-hiker

Hiking - The area is excellent for the resident and through-hiker The trails are in acceptable condition and a loop trip opportunity exists

Riding - The majority of the trails are components of the Appalachian Trail System Use of horses, llamas, donkeys, and other saddle or pack stock is not allowed on the Appalachian Trail, which is designed, built, and maintained by hikers for foot travel only Use of animals and mechanized transport is prohibited on virtually all sections of the Appalachian Trail

Photography - Good opportunities exist

Special Features

What is the area's capability to provide outdoor education and scientific study, both formal and informal, in a manner compatible with wilderness? *Opportunities exist in a variety of disciplines, including geology, archeology, biology, and dispersed* recreation

Is there an abundant and varied wildlife population? The presence of game and non-game animals would typify an eastern hardwood forest in the Blue Ridge Mountains characterized by rather remote, rugged, and mature forest conditions Accurate populations figures are not available for Three Ridges

Manageability:

What are the characteristics of the surrounding area including ROS classification, adopted VQO, and present and planned uses? Three Ridges is surrounded by a considerable amount of private land ROS on that portion of nearby National Forest is roaded *natural (RN) The VQO primarily varies from retention (R) to partial retention (PR), because of distinctive landscape and aesthetic* values along the main travel and visible routes

Future land use on private land will possibly continue to adversely affect the aesthetic values associated with agricultural, residential, and recreational uses The privately owned Wintergreen Ski Resort development is located a short distance to the northeast across SR 664, Crabtree Falls and Montebello Campgrounds (private) and Crabtree Falls Site (NF) are only a few miles west along SR 56, the Blue Ridge Parkway is adjacent to the northside of the area The Lesesne State Forest is adjacent to Three Ridges on the southeast corner, a short distance south of Ramsey Gap Other adjacent private lands are valued for their apple orchards and other agricultural uses Development for residential purposes is increasing

Do boundary locations conflict with important existing or potential public uses outside the boundary that might result in demands to allow nonconforming structures and/or activities in the wilderness? Even though development is likely to continue on private land around and near the boundary, encroachments are not expected to be a serious problem or concern

Is it possible to readily and accurately describe, establish, and recognize boundaries on the ground? YES *The current National* Forest boundary is marked

Do boundaries, where possible, conform with terrain or other features that constitute a barrier to prohibited use? Some portions of the boundary are located in areas that would be difficult to cross, such as the Tye River (except at the developed crossing) and steep, rocky slopes

Do boundaries, to the extent practicable, act as a shield to protect the wilderness environment inside the boundary from the sights and sounds of civilization? The rugged, forested terrain provides somewhat of a shield of protection/privacy along some of the boundary However, farm scenes, homes, and apple orchards adjacent to the boundary are noticeable in several locations Private developments and public roads near the boundary can be expected to create some sounds The flow of Tye River, along the southern *boundary, helps muffle the unnatural sounds*

Do boundaries provide adequate opportunity for access and traveler transfer facilities? YES

If the area contains less than 5,000 acres·

Due to physiography or vegetation, is the area manageable in its natural condition? YES

Is the area contiguous to existing wilderness, primitive areas, administration-endorsed wilderness, or roadless areas in other Federal ownership? No, the area is not contiguous to any such areas The Priests area to the south, across SR 56, is also being evaluated for its wilderness potential

Availability

Describe other (nonwilderness) resource demands and uses.

Recreation - As noted previously, this area serves the dispersed recreation users of the Appalachian Trail. Hunting use is second in importance to hiking and doesn't appear to be high ATV trespass is infrequent and occurs in isolated areas where roads form or approach the boundary

Information on Wildlife Species, Populations, and Management Needs - Three Ridges contains game and non-game animals commonly found on the eastern side of the Blue Ridge Mountains Some miscellaneous habitat improvements have occurred on old home sites, old fields, and in key wildlife areas (grape, birch patches) Since the Three Ridges area has been essentially under custodial management, species associated with late-successional habitat and undisturbed old-growth would prevail Bear is currently the featured wildlife species under multiple-use management

Water Availability and Use - Water sources are located at each of the trail shelters Water is readily available for wildlife It is recommended that all water be treated for safe human consumption

Livestock Operations - NONE

Timber - Even though there are some good sites with quality timber, any attempt at harvest operations would be very limited because of the difficult access and terrain Although there are two rights-of-way which have not been developed, road construction is not considered economically feasible There are no activities currently planned

Based on data in the Continuous Inventory of Stand Conditions (CISC) data base that was used in the existing forest plan, there are approximately 1,170 acres of suitable forest land in the Three Ridges area This amounts to approximately 24 percent of the area's total acreage

Site indices generally run in the 40s and 50s for the upland oaks on the ridges, 70s and 80s for the oaks on slopes, and 80 to 100 for the cove species

Minerals - There are no outstanding rights The area has no known potential for oil and/or gas recovery

Cultural Resources - Most of the Three Ridges area contains very steep and rugged terrain that would not have offered an opportunity for either prehistoric or historic activity Portions of the area that contain springs, gaps, or terraces and floodplains along streams did offer camping opportunities for Native Americans Several sites have been discovered in the vicinity of Maupin Fields

District records indicate there are at least five house sites within the area There is potential for the discovery of additional house sites, old family cemeteries associated with the structures recorded previously, rock walls, terraces, or other indications of Euro-American settlement in this portion of the Blue Ridge Mountains

There are no conflicts with current/future management needs under the Antiquities Act of 1906, the National Historic Preservation Act of 1966, the Archaeological Resource Protection Act of 1979, and other laws providing protection for cultural resources on federally owned lands

Authorized and Potential Land Uses - There are no existing special uses nor any anticipated, other than the Memorandum of Understanding with the Tidewater Appalachian Trail Club for managing this National Scenic Trail in the Three Ridges Area

Management Considerations including Fire, Insects and Diseases, and Presence of Non-Federal Lands - Because of the protection from fire under National Forest management, and successful fire suppression efforts, there is considerable buildup of light and heavy fuels in the area Due to the steep terrain and limited accessibility, suppression efforts would be limited to hand crews and/or aerial attack

Potential spread of the gypsy moth is extremely high since oaks are the preferred host species and form a large component of the area. Egg mass surveys indicate that numbers are increasing and some defoliation and mortality in the near future is very likely Salvage operations would not be considered practical under current management of the area

There are no private in-holdings

What outputs are currently produced or could be produced in the future? Dispersed recreation activities, primarily hunting, hiking and backpacking, are expected to continue at about the same low level of use The prominence and visibility of the Three Ridges area make it sensitive from a visual standpoint Retaining it in a natural condition has been a high priority Conventional and cable logging methods are presently impractical, since development and removal costs would far exceed timber values

Is the area located such that the need for increased water production and/or additional onsite storage is so vital that installation or maintenance of improvements is an obvious and inevitable public necessity? NO

Would wilderness designation seriously restrict or prevent the application of wildlife management measures of considerable magnitude and importance? NO

Is it a highly mineralized area of such strategic or economic importance and extent that restrictions or controls due to wilderness designation would not be in the public interest? NO

Does the area contain natural phenomena of such unique or outstanding nature that general public access and special development to facilitate public enjoyment should be available? NO

Is the land needed to meet clearly documented resource demands such as for timber, mineral production, or developed recreation? NO

Is the land committed through contractual agreements for use, purposes, or activities not in concert with wilderness requirements? NO

Need

Other Wildernesses:

How far is it to the closest existing wilderness? The 10,000 acre Saint Mary's Wilderness is located approximately 4 miles to the northwest of Three Ridges

What level of use currently exists in near-by existing wilderness? What trends exist in the use of these areas? St Marys wilderness received a reported 6,000 recreation visitor days of use in 1989 This high level of use has had a significant impact on the wilderness and natural resources in the area Management activities, in the form of prohibitions on camping and campfires, have been implemented in portions of the area in an attempt to prevent further damage

Is the population in and around these areas increasing or decreasing? How quickly is it increasing or decreasing? Three Ridges is located in Nelson County where, between 1980 and 1990, the population grew from 12,204 to 12,550 people This equals an average annual growth rate of 0 3 percent In Augusta County to the west, the population grew from 53,732 to 56,315 people over the same period of time, at an average annual rate of 0 5 percent To the north and east, the population in Albemarle County increased significantly from 55,783 to 63,544, an average annual increase equal to 1 3 percent

Nonwilderness lands:

Are there opportunities for unconfined and primitive recreation experiences on nonwilderness areas in the vicinity? If so, where? Many acres of National Forest Land, suitable and available for primitive recreation, are within a reasonable distance of Three Ridges

Habitat:

Are there any biotic species in the area that are directly competing with increasing public use and development? While a complete inventory of the area's flora and fauna has not been completed, high mountain elevations tend to harbor rare species, some of which might need or benefit from active management Depending upon the management practice and/or species, wilderness designation might preclude or make such efforts more difficult

Could these needs be provided for through means other than wilderness designation? Yes, these needs could be provided for through special management area designation or through allocation to management prescriptions designed to provide for bear habitat

Is there a need to provide a sanctuary for biotic species that cannot survive in less than primitive surroundings? This is unknown at the present time Studies and data collection are being completed by various scientific and interested groups/individuals

George Washington National Forest
Pedlar Ranger District

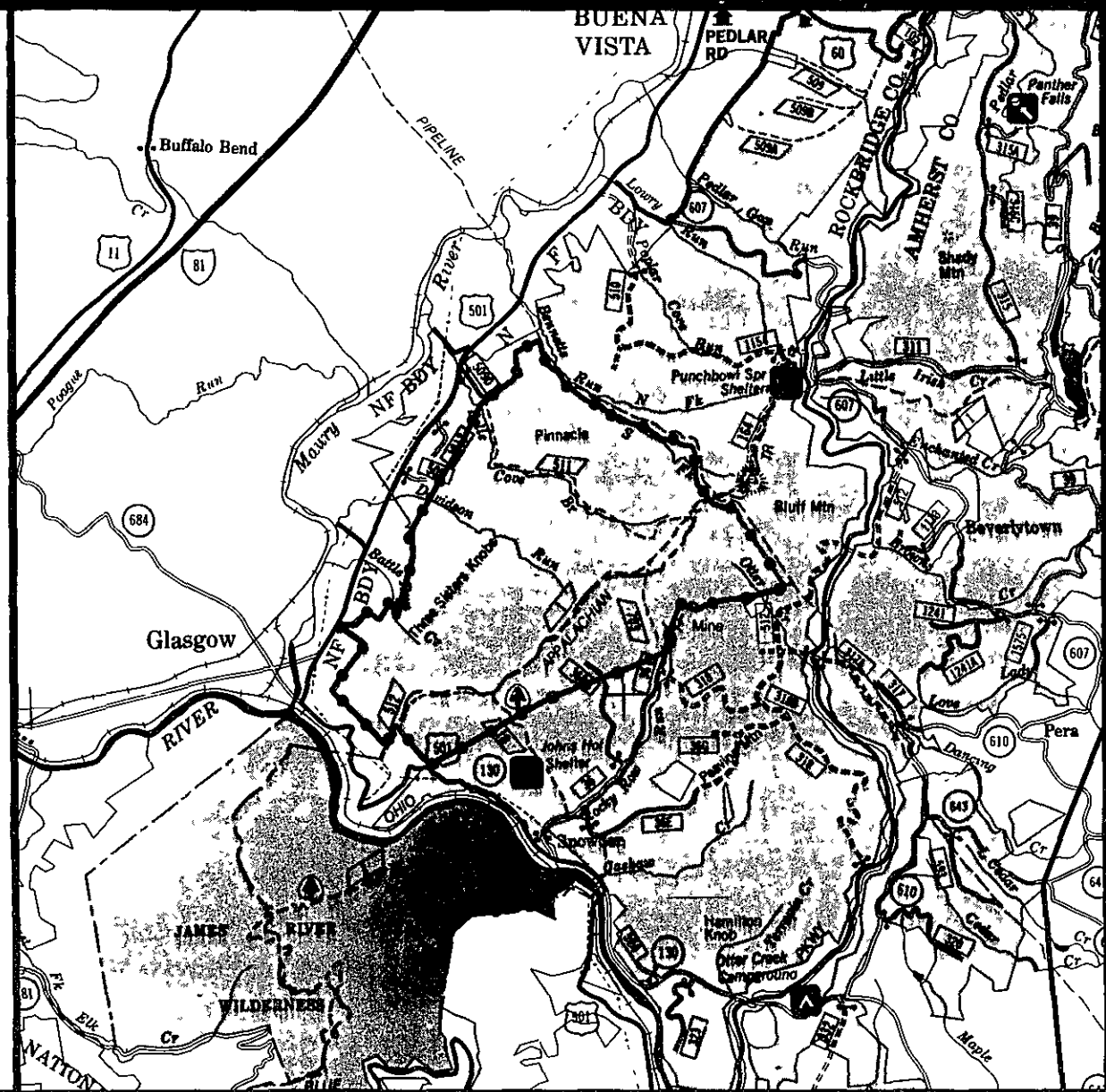
THREE SISTERS ROADLESS AREA

Scale

1:126,720

1/2 inch = 1 mile

Roadless Area



THREE SISTERS ROADLESS AREA

I DESCRIPTION

Acres• approximately 8,150

Location and vicinity The Three Sisters Area is located in the southwestern corner of the Pedlar Ranger District, George Washington National Forest It is in Rockbridge and Amherst counties, Virginia The area is approximately 5 miles southwest of Buena Vista, east of State Route 501, and north of the James River Glasgow, Virginia, a town of about 4,000 population is only a mile from the southwestern boundary

Starting at the northern most point, the boundary follows the Lynchburg Gas Pipeline running southeast along Bennetts Run and the South Fork of Bennetts Run to the point where it intersects another pipeline running west-southwest which is no longer in use The boundary follows this unused pipeline, crossing Peavine Mountain In Rocky Row Run, the boundary leaves the pipeline and proceeds southwest, following no identifiable ground features, for about three miles In the southwestern section of the area, the boundary follows private land from a corner just north of U S Route 501/State Route 130 to the corner near Davidson Run From this location, roughly paralleling US 501 at a distance of about 1/3 mile, the boundary rejoins the Lynchburg Gas Pipeline back at the northern most point of the area

About 3/4 of the total acreage is in Rockbridge County, on the northwest side of Rocky Row Ridge System, and about 1/4 of the area is in Amherst County, on the southeast side of the mountain range

Describe access including roads and trails leading to the area

ROADS Access to the northeastern portion of the Three Sisters area boundary is provided by U S Route 501 and Forest Roads 509, 1813, 509B, and 509D The Forest roads are gated year-round and vehicle use is strictly administrative Forest roads do provide access for a short distance into the area, where they terminate because of topography

FDR 164, which leads to the top of Bluff Mountain, passes about 1/4 mile from northwestern boundary This road is usually accessible only by four-wheel drive and is open to the public only from October 1 to the end of bear season (early January) each year It is gated and used only for administrative purposes the remainder of the year

On the south side, Forest Road 36 provides access into the Amlite Slate Mine which is outside the area An old mine road leads up to Slaty Gap and Peavine Mountain, at one time connecting to the boundary pipeline This road was blocked with an earthen mound in 1990, as part of the Amlite Restoration Project

Forest Roads 1881 and 317A provide access near the eastern corner of the area Forest Road 36D was recently extended as part of the Big Rocky Row Timber Sale A gate at the intersection of Forest Roads 36 and 36D is closed during the January/March season only

The road loop near the southern border made by Forest Roads 36B and 1800 was closed about two years ago to reduce motorized traffic on the Appalachian Trail in Johns Hollow The closure on 36B was breached in November 1990 and will need to be closed again When open, Forest Roads 36B, 1800, 559, and 36D have provided motorized access within the Three Ridges Area

Forest Road 510 is blocked by a tank trap just before it reaches the northern boundary All-terrain vehicles may be able to get around the closure, but it has effectively stopped other motorized traffic South from the closure, Forest Road 510 becomes a footpath which leads up the South Fork of Bennetts Run to the point where it again intersects with a pipeline

On the lower slopes around the outer edges of the area, where timber harvests have occurred, there are generally networks of old roads and skid trails, most of which are effectively closed and revegetated Some are quite old

TRAILS The Appalachian National Scenic Trail (AT), which runs along the ridge from Bluff Mountain to Little Rocky Row and then southeast down Johns Hollow, is the primary trail route in this area It is accessible by auto from the Punchbowl Shelter Area, the Blue Ridge Parkway (some seasonal limitations exist), Bluff Mountain (only during hunting seasons), and from Forest Road 36, at Johns Hollow (year-round)

The Saddle Gap Trail, Forest Trail 703, serves the AT from Forest Road 36 near the Amlite Mine, and is accessible year-round The lower portion of the Saddle Gap Trail is an old logging road recently re-opened and used to access part of the Big Rocky Row Timber Sale

The Little Rocky Row Trail, Forest Trail 512 intersects the Appalachian Trail at Little Rocky Row ridge Little Rocky Row Trail ends on US 501/SR 130 There is no parking at this point, and only a small pull-off exists along the highway The lower part of Forest Trail 512 passes through private land The Forest Service does not have a right-of-way for this section However, this section of trail has been used for many years

The Belle Cove Trail, Forest Trail 511 leads west and northwest from the AT at Saltlog Gap to US 501 It is accessible from 501 year-round

On a 1927 map, a trail is shown connecting the upper part of the old road/trail in the upper South Fork of Bennetts Run to Saltlog Gap It runs downhill, south around the east side of Silas Knob, and south down the crest of Peavine Mountain, to Slaty Gap

General description of the area geography The area contains geologic, physiographic, and mineral resource features which do not distinctly differ from the majority of the Pedlar Ranger District It is underlain by a diversity of rock types as evidenced by the difference between the Rocky Row Ridge System and the nearby Three Sisters/Pinnacle Trend The area is geologically described as being a sequence of Cambrian volcanic and sedimentary rock, resting atop the Blue Ridge Complex, called the Blue Ridge-Catoctin Mountain anticlinerium Soils are variable There is a small area of the Laidig-Sherando association in the lower elevations around the north corner of the area, a strip of Stokesville-Leetonia, which is basically defined by the Three Sisters and Pinnacle, a strip of Cardiff-Unicoi, which is found on most of the northwest slopes of Rocky Row and the upper part of the southwest slopes of Rocky Row, and Hayesville-Porters-Caloctin, which includes the area around Saltlog Gap and the lower southeast slopes of Rocky Row

General description of the area topography The Three Sisters Area contains three dominant topographic features, which are Three Sisters Knobs, The Pinnacle, and a long ridge which includes Big and Little Rocky Row, Silas Knob, and the southwest mid-slopes of Bluff Mountain

Topography in the area is very rugged The Rocky Row Ridgeline is fairly level along its crest, with steep sideslopes, especially on the southeast slopes The southeast side of the crest is characterized by an outcropping of "ledgy" rock along its entire length, giving the ridge its name This outcropping is visible from numerous points on US 501, Forest Road 36, and other areas to the southeast Rocky Row provides overlooks at several places along the AT

The Three Sisters Knobs and the Pinnacle represent another ridge trend which is altered by deep drainages The slopes are very steep on all sides and there are many exposed rubble slides

Elevations range from 900 feet to 2992 feet above sea level The Three Sisters Ridges and the northwest side of Rocky Row are drained by Bennetts Run, Belle Cove Branch, Davidson Run, Battle Run, and some smaller unnamed drainages These all drain into the Maury River except for those unnamed ones on the southern end of the area, which run directly into the James River The area around Little Apple Mountain and Saltlog Gap is drained by the headwaters of Otter Creek into the James River The rest of the southeast side of Rocky Row is drained by Johns Hollow, Cedar Bridge Hollow, and Grants Hollow, all of which drain into Rocky Row Run which empties into the James River A few unnamed drainages near Little Rocky Row empty directly into the James River

General description of the area vegetation, including the ecosystem type The area is forested with older species typical of the Eastern Deciduous forest type Chestnut oak and scarlet oak predominate on the dry rocky ridges and steep sideslopes, with low-quality white pine and yellow pine interspersed throughout Better quality upland and cove hardwoods can be found on the moister mid-slopes and narrow drainages Dogwood, grape, serviceberry, and rhododendron are abundant in the understory

Key attractions, if any, including sensitive wildlife and scenic landmarks
WILDLIFE There are no records of any sensitive wildlife species in the area The presence or absence of sensitive wildlife species in the area needs to be determined through a complete inventory

Bennetts Run has a population of Native Brook Trout Belle Cove, Davidson Run, and Battle Run are classified by the Virginia Department of Game and Inland Fisheries (VDGIF) as having insufficient flow to support Brook Trout However, during a recent field trip, Davidson Run was determined to be capable of sustaining a small Brook Trout population

Black bear is the featured species in the area, except for one compartment that features White-Tailed deer The rugged terrain makes for good bear habitat, but the poor soils limit hard mast production throughout much of the area

LANDMARKS The rock outcropping along the Rocky Row Ridge is the primary scenic landmark in the area, as viewed from below and as experienced by hikers on the AT The AT itself is the key attraction for most recreationists in the area, but the rugged, unroaded terrain attracts bear hunters There are very few views to the west from the AT but several to the east, including views of the James

River From several points the Amlite Mine can be seen, and is quite dominant because of the visual contrast caused by past strip mining activities

II INVENTORY

Human Influence

To what degree have humans and past/present human activity affected natural ecological processes and conditions? Bear hunting is facilitated in the northeast section by good access, in spite of the rugged terrain Hunting pressure may have resulted in relative low populations of black bear, again, in spite of the good habitat Hikers on the AT and other trails may, to a minor degree, be a disturbance to bears, especially during the summer months when the cubs are young

Along the southeast slopes of Rocky Row and the lower northwest slopes of Three Sisters and Pinnacle, there are complicated networks of old logging roads, most of which are closed to vehicle traffic and few of which are mapped These trails may facilitate some hunter/hiker traffic, but their impact on wildlife/ecological processes is probably minimal Some of the old roads and pipelines in the area experience some insignificant surface erosion

Timber harvesting has occurred for many years on the lower elevations of the Three Sisters Area The timber harvests prior to the 1960s left the poorest trees in the overstory Since the 1960s three to four hundred acres within the area have been clearcut About half of the clearcut acreage was more regenerated with hardwood species but was, instead planted with pines

Past timber harvesting and associated road building and cultural treatment activities have not had a significant affect on the natural ecological processes Pine plantations have placed some areas which would have naturally regenerated with a pine-hardwood mixture

The Hellgate Fire in the 1960s destroyed some timber along the south side of Bennetts Run, below the confluence of the forks Little, if any, of this timber was salvaged due to steep slopes and low timber quality Part of the C&O Railroad fire burned in the southern end of the area The timber there was salvaged where feasible and is in regeneration now

The only known home site is that of Charlie Garrett's near the Saddle Gap Trail, about a mile from Forest Road 36 It is maintained as a wildlife opening by pruning cherry and apple trees, and cutting brush

There are three trout stream habitat improvement structures on Bennetts Run along the boundary of the area

To what degree is the area natural or natural appearing and free from disturbance? Except for the pipelines which adjoin the northern and northeastern boundaries, and the lower slopes where timber has been harvested, the area is natural appearing and mostly free of disturbance The roughness of the terrain and the poor quality of much of the timber have prevented development Views from the Appalachian Trail to the northwest are screened by vegetation or mountains, so the developed private lands in that direction are for the most part not seen Developed areas can be seen at a distance of several miles to the southeast, but in the foreground and middleground highways and primary forest roads are not seen Some of the timber harvesting and old roads and skid trails are evident An old slate mine can be seen from many places within the area

If the area ecological processes and/or natural appearance have been altered by past or present human activity, is the land regaining a natural, untrammeled appearance? Yes Harvested areas become less apparent each year, although some of the older cuts on the southeast side of Rocky Row are still quite evident from the Appalachian Trail During leaf-off season, several old roads and skid trails associated with these cuts are still noticeable Since these and other roads are excavated, they will continue to be seen during the dormant season, even when fully revegetated The Amlite Mine is undergoing restoration by Rockydale Quarries, but the amount of old excavation on that site will continue to be apparent

Does the existing or attainable National Forest System ownership pattern, both surface and subsurface, ensure perpetuation *of identified wilderness value?* *National Forest surface ownership is solid, and adjoining private lands are predominantly steep and* not likely to be developed Mineral rights on two tracts extending a short distance into the area have been reserved These tracts are N-43 (Snowden Slate Company--Kelsey and Smiley Reservation) and N2/1-2 (Paxton Heirs) Minerals within the area could be mined as long as the mineral rights are privately held

Is more than 15 percent of the area in non-native vegetation? NO

Improvements, Structures, and Nonconforming Uses

Are any of the following types of areas, features or nonconforming uses present? If so, where?

Areas with evidence of historic mining at least 50 years old (Do not include areas of significant current mineral activity)· None inside the boundary

Areas under current mineral lease that contain a "no surface occupancy" stipulation There are no current leases within the Three Sisters Area All previous leases have expired

Areas under current mineral lease where the lessee has not exercised development and occupancy rights NONE

Recreation improvements such as occupancy spots or minor hunting or outfitter camps NONE

Timber harvest areas where logging and prior road construction are or are not evident. Timber harvesting, related haul and skid road construction and cultural treatments have occurred for many years on the lower elevations within the entire area Timber harvest activities performed on areas harvested from the early 1900s through the 1960s are not highly evident

Since the 1960s, three hundred to four hundred acres have been clearcut About half of the clearcut acreage has been planted with pines These areas, containing young timber stands, revegetated roads and on-going cultural treatments are highly evident

Cultural treatments involving plantations or plantings. White pine has been planted or seeded in several stands in the lower elevations of the area where timber management has taken place in the past

Private inholdings in the area NONE

Dwellings on private inholdings NONE

Nonconforming structures and improvements NONE

Ground-return telephone lines NONE

Watershed treatment areas. NONE

Roads. There are no open public roads in the area Several low standard Forest Service roads used only for administrative access extend a short distance into the area

Can existing nonconforming uses be effectively mitigated or terminated through removal or rapid natural deterioration? Recent timber harvests will return to natural appearance over time Closed roads and skid trails will revegetate and become less obvious

Are improvements in the area being affected by the forces of nature rather than humans, and are they disappearing or muted? If left to the forces of nature man's past activities in the area will become muted over time

If there are timber harvest areas, has less than 20 percent of the area been harvested within the past 10 years? YES

Does the area contain less than 1/2 mile of improved road for each 1,000 acres? YES

Are all existing roads under Forest Service jurisdiction? YES

III. EVALUATION

Capability

Does the area contain the basic characteristics that make it suitable for wilderness designation without regard to its availability for or need as wilderness? Consider the following characteristics in analyzing the quality of the wilderness resource If these characteristics are determined to be important, describe and refer to them

Experiential benefits Does that area provide the opportunity for solitude and serenity? Opportunities for solitude and serenity in this fairly large, rugged area are good Sights and sounds from human activity along the boundaries can be heard

Challenge Does the area offer visitors the opportunity to experience adventure, excitement, challenge, initiative, or self-reliance? Is access easy or difficult? The area does offer considerable opportunities for challenge, adventure, excitement, initiative, and self-reliance Access can be easy or difficult, depending on the access point chosen and the season of year Some access roads are open seasonally

Outdoor Recreation Opportunities What is the area's capability for providing primitive and unconfined types of recreation including

Camping - Good opportunities for primitive camping are available

Hunting - There are excellent opportunities along the boundary Rugged country makes hunting difficult in the section between Rocky Row and Three Sisters

Fishing - Some native trout are present in Bennetts Run

Mountain Climbing - There are rock climbing possibilities, although this activity doesn't normally occur

Ski touring - Not applicable in this area due to insufficient snowfall and difficulty of access to the higher terrain

Canoeing - No suitable waters

Boating - No suitable waters

River Rafting - No suitable waters

Backpacking - Opportunities are excellent along the trails and old roads in areas suitable for foot travel

Hiking - Hiking opportunities are similar to those for backpacking For day hiking, a loop hike can be made using the Saddle Gap Trail, the AT, and Forest Road 36 Vehicles can also be parked at the ends of various trails

Riding - Some areas are suitable, but since most existing side trails in the area connect to the AT, this activity is limited Use of saddle stock is prohibited on virtually all sections of the Appalachian Trail

Photography - There are many excellent opportunities for scenic and close-up photography

Special Features

What is the capability of the area to provide outdoor education and scientific study, both formal and informal, in a manner compatible with wilderness? The area is suitable for teaching botany, biology, map reading and orienteering, outdoor skills, photography, and geology None of these activities should conflict with wilderness values

Is there an abundant and varied wildlife population? The area provides good bear habitat due to the remote terrain Good mast production is limited, due to the area's poor soil, except in Bennetts Run, Belle Cove, and the mid-southeast slopes of Rocky Row Deer, bear, squirrel, and turkey sign is widespread The headwaters of Bennetts Run are largely undisturbed and the creek provides good Brook Trout habitat

The Three Sisters Area supports a number of other game and non-game species typical of the Mid-Appalachian Region

Manageability

What are the characteristics of the surrounding area including ROS classification, adopted VQO, and present and planned uses?

ROS The area contains a large core of Semi-Primitive Non-Motorized (SPNM) Surrounding this, the area is Roaded-Natural (RN), due to the influence of Forest Roads 36, 36B, 36D, 164, 1154, 510, 1813, 1814, 509, 509B, 509D, and 559, and US 501

VQO Along the Appalachian Trail location on Rocky Row, a zone of Retention that also defines the AT Management Area extends outward up to 1/2 mile (foreground, depending on topography and viewing sites) Middleground outside this zone may be Partial Retention Areas in the foreground of 36 and 36D, and US 501, are typically in Partial Retention Most of the remaining area, especially the deep drainages around Three Sisters and the Pinnacle, are in Modification The peaks of these mountains, where they are viewed as middleground from the AT or background from US 501, are in Partial Retention Outside the boundaries of the area, the AT Management Area is in Retention and other areas are Partial Retention or Modification in the same manner as within the area

PRESENT AND FUTURE USES The Amlite Mine, outside the Three Sisters Area, can be seen but is being restored A timber sale is planned in the north fork of Bennetts Run During the early planning stages for this sale, it was determined that building a road to harvest some of the timber in Belle Cove would be prohibitively expensive relative to the volume of accessible timber Small sales are planned in the area within 2/3 mile of US 501, from Davidson Run to north of Belle Cove, up to and within the boundary of the area Future sales are also possible on the mid and lower slopes of the southeast side of Rocky Row, although past activity would dictate that this not occur until the late 1990s

Some motorized traffic breaches the earthen mound closures on Forest Road 1881 to access a pipeline leading up to Apple Orchard Mountain, a slope known locally as "King Kong Hill"

The D-level road extension to FDR 36D and other scheduled roads under the Rocky Row Timber Sale Contract, are planned for seeding and closure in the spring of 1991

Do boundary locations conflict with important existing or potential public uses outside the boundary that might result in demands to allow nonconforming structures and/or activities in the wilderness? Yes The Appalachian Trail, both inside and outside the boundary, is currently maintained with mechanized equipment such as chainsaws and gas powered weed-eaters and brush cutters Under Wilderness designation, trail maintenance would be more difficult, especially as timber on the crest of Rocky Row is subject to frequent windthrow One way to avoid this conflict would be relocate the southeast boundary of the proposed area along the northwest side of the AT, from Bluff Mountain to the Little Rocky Row Trail, and along this trail where it crosses the National Forest Boundary The AT treadway would then not be in the wilderness, and mechanized maintenance could still continue About 25% of the originally proposed area would then be outside the boundary Much of that area, on the southeast side of Rocky Row, is in the AT Management Area and is not suitable for timber management Therefore, a wilderness-like condition status could still be retained in the area excluded

Is it possible to readily and accurately describe, establish, and recognize boundaries on the ground? Yes, where the area boundary follows the pipelines and Forest boundaries The cross-country, straight-line boundary from just north of the Amlite Mine, west-southwest to the NF boundary corner, would have to be surveyed, painted, and regularly maintained in order to be apparent on the ground That section leading from the Forest boundary corner near Davidson Run north-northeast to the pipeline would also require the same action Establishment of these two boundary sections would be time consuming and costly

Do boundaries, where possible, conform with terrain or other features that constitute a barrier to prohibited use? No Boundaries are evident along the pipelines and property lines, but they would not constitute a barrier to prohibited uses except where located on rough terrain None of the boundaries of this area conform with any terrain features that would block prohibited use The only known prohibited activity currently taking place is all-terrain vehicle (ATV) use near Forest Road 510, King Kong Hill on the pipeline, and on the old road network in Johns Hollow In recent years, improved law enforcement, blockage of access with tank traps, and the cooperation of ATV groups toward developing the Terrapin Creek ATV area have combined to reduce and minimize this use

Do boundaries, to the extent practicable, act as a shield to protect the wilderness environment inside the boundary from the sights and sounds of civilization? No, but the layout of the area, the location of the boundaries, and the topography combine to minimize the sights and sounds of civilization within the area

Do boundaries provide adequate opportunity for access and traveler transfer facilities? Yes Access by US 501 and Forest Roads 36, 164, 1154, 510, 1881, and 317A have been previously described There is not adequate parking available at the most likely access points for any increased use The primary access points would probably be the Belle Cove Trail at US 501, the Saddle Gap Trail at FDR 36, and the AT at Johns Hollow on FDR 36 Only Belle Cove has anything other than roadside parking currently available Some users of the area might also gain access by hiking the AT from the Blue Ridge Parkway near the Punchbowl Shelter, where parking facilities are adequate Currently, some people park at the intersection of roads 1154 and 164, near the Punchbowl

Availability

Describe other (nonwilderness) resource demands and uses

Recreation - Hiking, backpacking, native brook trout fishing, camping, some photography, sight-seeing, wildflower and bird viewing, mushroom hunting, and ginseng digging occur in the area Hunting is also very popular, with an emphasis on bear hunting in the more rugged areas

Information on Wildlife Species, Populations, and Management Needs - Populations are typical for this terrain type on the Pedlar Ranger District There is a noticable amount of rugged escape habitat for bear Past wildlife habitat management has been accomplished through habitat improvement associated with timber sales Most of the seeding and soft mast planting associated with the recent Big Rocky Row Timber Sale is planned for the spring of 1991 Except in the lower elevations, where timber management has occurred, most of the area is characterized by habitat that favors late successional vegetation

Water Availability and Use - For hikers, no water is available on the Appalachian Trail from Punchbowl Shelter to Johns Hollow The Little Rocky Row Trail has no water Water is available along the lower portions of Saddle Gap and Belle Cove Trails All water should be treated for safe human consumption

Most drainages in the area contain perennial water higher up than indicated by the topographic maps

Livestock Operations - NONE

Timber - Previously harvested areas receive cultural treatments as needed to enhance timber production Much of the land where timber production is possible has been harvested Some small, fuelwood sales are planned within the area over the next few years As harvested stands reach commercial size, they will be managed to produce timber for the local market Site indices generally run 40-50 for the upland oaks and 60-70, with some 80s, for the cove hardwoods

Minerals - There is no active minerals extraction taking place Portions of two tracts where mineral rights have been reserved are located within the Three Sisters Area There are five expired oil and gas leases There have been no requests to explore or develop any of these leases or outstanding rights

Cultural Resources - The only known cultural structure within the area is the Charlie Garrett Homesite, maintained as wildlife opening number BV-42 It is located near the Saddle Gap Trail about a mile from FDR 36 There is a chimney, a clearing, and a large number of cherry and apple trees are on the site

Some prehistoric sites are known in lower Belle Cove within the area In the fertile flat hollows such as upper Belle Cove, there is a high probability of prehistoric sites, but this has not been investigated

Authorized and Potential Land Uses - The pipeline along the northern boundary is the only currently authorized land occupancy No others are anticipated

Management Considerations Including Fire, Insects and Diseases, and Presence of Non-Federal Lands - FIRE Past fire history includes the 1963 C&O Railroad Fire, which extended within the southern boundary of the area, and the 1965 Hellgate Fire, which burned the north slopes of the Pinnacle The rough terrain, rockiness, and poor access make fire suppression activities very difficult Lightning fires typically occur in this area and require air support, portable pumper units, extensive hose lays, and large crews

INSECTS AND DISEASES Southern Pine Beetles killed yellow pines in many scattered locations throughout the area in the 1970s Some attempts at salvage and control were made, but were limited by the low value and inaccessibility of most of the affected stands Potential spread of the gypsy moth is extremely high since oaks are the preferred host species Trapping results currently show low numbers

PRIVATE LANDS The area is joined by private lands along approximately one- third of its boundary There are no private inholdings

What outputs are currently produced or could be produced in the future? Timber has been harvested on a regular basis in the area and current plans are to continue to do so on suitable lands It is unlikely that outstanding mineral rights will be exercised All forms of recreation currently existing in the area are likely to continue in the future The pipeline occupancy on the area boundary will probably continue The area's watersheds will continue to produce at present levels of quality and quantity Current wildlife populations are not likely to fluctuate

Is the area located such that the need for increased water production and/or additional on-site storage is so vital that installation or maintenance of improvements is an obvious and inevitable public necessity? The Forest Service has never been approached regarding possible impoundments in the area, and no analysis of the area's suitability for this purpose has been made

Would wilderness designation seriously restrict or prevent the application of wildlife management measures of considerable magnitude and importance? No, timber management practices within and around the boundary have enhanced habitat for some popular game species that favor eary successaionl vegetation Wilderness designation would preclude future vegetative manipulation The current custodial-type management would continue in the rugged interior of the area

Is it a high minerals area of such strategic or economic importance and extent that restrictions or controls due to wilderness designation would not be in the public interest? There may be slate or gravel deposits in the area, but no strategic or economically important mineral deposits are known

Does the area contain natural phenomena of such unique or outstanding nature that general public access and special development to facilitate public enjoyment should be available? Increased developments for parking would be necessary if dispersed recreation use increases

Is the land needed to meet clearly documented resource demands such as for timber, mineral production, or developed recreation? No Lands within the boundary where timber management activities are possible are similar to other lands available elsewhere No exceptional mineral deposits are known or suspected The existing Appalachian Trail is consistent with wilderness management if concerns about mechanized trail maintenance can be resolved

Is the land committed through contractual agreements for use, purposes, or activities not in concert with wilderness requirements? No, except for the pipeline along the northern boundary

Need

Other Wildernesses

How far is it to the closest existing wilderness? The 8,903-acre James River Face Wilderness, on the Jefferson National Forest, is directly across the James River to the south The 9,835-acre Saint Marys Wilderness is about 19 miles northeast of the area

What level of use currently exists in near-by existing wilderness? What trends exist in the use of these areas? An estimated 6,000 visitor days of recreation were recorded in St Marys Wilderness in 1989 This is a significant amount of use and has resulted in negative impacts on the area's wilderness qualities and resources A ban on campfires along the St Marys River has been implemented in an effort to mitigate these impacts Trends indicate that use in St Marys has increased steadily over time

Is the population in and around these areas increasing or decreasing? How quickly is it increasing or decreasing? In general, populations in and around the George Washington National Forest, and in Virginia as a whole, have increased over the last ten years The Three Sisters area is located relatively close to several population centers including Buena Vista, Waynesboro, and Lexington, Virginia Wilderness use can be expected to increase as populations increase, but not necessarily in proportion to population increases

Nonwilderness lands

Are there opportunities for unconfined and primitive recreation experiences on nonwilderness areas in the vicinity? If so, where? These opportunities presently exist within the area boundary The area to the northeast, including Target Hill, Lowry Peak, and Little Pinnacle, is also suitable for primitive recreation There are also many other acres of National Forest Land within reasonable distance where primitive recreation experiences can be enjoyed

Habitat:

Are there any biotic species in the area that are directly competing with increasing public use and development? Increased use and development could possibly have a negative impact on bear

A complete inventory of the area's flora and fauna has not been completed

Could their needs be provided for through means other than wilderness designation? Yes, wilderness designation would not be necessary to protect bear in this area Due to the rugged terrain, and inaccessibility and low quality of the timber, additional development is unlikely where it has not already occurred

Is there a need to provide a sanctuary for biotic species that cannot survive in less than primitive surroundings? NO

Appendix D - Environmental Impact Statement
WILD AND SCENIC RIVER ELIGIBILITY REPORTS

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I. INTRODUCTION

This appendix contains evaluations of 14 rivers located in or close to the George Washington National Forest These evaluations determine which of the 14 rivers have qualities that make them eligible for inclusion in the National Wild and Scenic River System. The evaluations also determine whether the eligible rivers should receive wild, scenic, or recreational river classification.

A determination locally that a river is eligible does not necessarily mean that it will meet suitability criteria when, in the final stages, it is evaluated from a national perspective. Eligibility evaluations are an initial step in a process that ultimately requires action by Congress to include a river in the National Wild and Scenic River System.

The Forest Service completed the eligibility and classification evaluations contained in this appendix. Suitability evaluations for each of the eligible rivers are being performed by a combination of state and federal agencies and will be published at a later date. The suitability studies are the final step in determining whether or not a river is recommended to Congress for further consideration

The evaluations presented here are in accord with the National Wild and Scenic Rivers Act of 1968 (the Act) and in response to the Nationwide Rivers Inventory (National Park Service, January 1982) and the concerns of the American Rivers Conservation Council.

For summaries of the evaluations, see tables 1 and 2 on pages 30, 31. Table 3 on page 32 lists the agencies responsible for the suitability evaluations For a more complete explanation of the evaluation process, see pages 33-37.

II. THE EVALUATIONS: WILD AND SCENIC DESIGNATION FOR LOCAL RIVERS

Stream miles listed are approximate and were taken from maps on a scale of 1/2 inch = 1 mile.

BACK CREEK

For evaluation purposes, Back Creek is divided into three segments. Back Creek is described in this report from its confluence with the Jackson River, north to its headwaters. A total of 32.79 miles is considered in this evaluation The majority of the stream corridor is in private ownership. George Washington National Forest land is on both sides of the creek for a total of 2.35 miles and on one side of the creek for an additional 1.52 miles. Both the streambanks and the stream are subject to riparian rights, since the stream is not considered navigable. This limits river access and use to property owners and guests. Back Creek is located entirely within Bath County, where officials express concern about additional federal control of land in the county.

Segment A - From Lake Moomaw to State Route 39 (5.59 miles)

This 5.59-mile segment flows through Back Creek Gorge. Blowing Springs Campground at State Route 39 provides the only public access until Lake Moomaw. The Virginia Commission of Outdoor Recreation found this segment eligible for inclusion in the Virginia Scenic Rivers System. This free-flowing stream traverses 2.35 miles (both banks) and 0.01 miles (one bank) of the Forest. There is little development along this segment and little disturbance. Water quality is considered average to good. There is some canoe use along Segment A when the water is high. There are several jeep trails, but no developed roads along this segment of Back Creek.

Eligibility of Segment A by.

Scenic Value: There is little development along this section of Back Creek. The corridor is considered attractive where the stream passes through the gorge. Overall the stream is small-to-medium in size, with a few medium-size pools. The rate of flow is medium except during storm periods. Topography along this segment is relatively steep The forest cover consists of hardwoods mixed with hemlock and pine Understory species are those common to the area. Large boulders add visual variety to the streambed in several locations. A Class A-Distinctive rating is assigned to the scenic values

Recreational Value: Recreation use along Segment A consists of fishing, canoeing, and kayaking Most of this use comes from adjacent landowners who post their property and prevent public access. During periods of high water, the segment through Back Creek Gorge from Blowing Springs to Lake Moomaw is used by both canoeists and kayakers. With Class 2 and 3 rapids present, this is an excellent white-water creek. This section is not classed as navigable A Class A-Distinctive rating is assigned to the recreation values.

Geologic Value· This segment contains interesting geological formations, including outcroppings and high cliffs through the gorge area. A Class A-Distinctive rating is assigned to the geologic values

Fish and Wildlife Values. This segment is not considered to be an outstanding fishery Some fish do enter Back Creek from Lake Moomaw, including spawning rainbow trout. Because the adjacent private property is posted, access is limited This corridor provides habitat for wildlife species typical of the Forest A Class B- Common rating is assigned to the fish and wildlife values.

Historic and Cultural Values: There are known prehistoric and historic sites along this segment that are eligible for the National Register of Historic Places. It is probable that additional prehistoric sites exist A Class A-Distinctive rating is assigned to the historic and cultural values.

Eligibility Determination:

Segment A of Back Creek is eligible for designation under the Wild and Scenic Rivers Act because it is free-flowing and has outstandingly remarkable scenic, recreational, geologic, historic, and cultural values.

Classification Determination:

Because Segment A of Back Creek is eligible for designation, it is necessary to determine the appropriate classification. According to the criteria in FSH 1909, Chapter 8, the entire 5.59 miles can qualify for inclusion in the system under the scenic classification. This classification is based primarily on the fact that development along the river is sparse and existing roads are inconspicuous

Segment B - From Blowing Springs Campground to Pump Storage Lake (9.96 miles)

This 9.96-mile segment is located within Bath County. The majority of land along this segment is privately owned. Back Creek touches National Forest System land at four locations on one side for a total distance of 1.51 miles. This segment is not considered to be navigable. There are no impoundments along this segment. State Highway 39 and County Road 600 parallel the shoreline and are evident from the stream. Open farm land, houses and bridges are common features. The size of the stream is medium to small. The flow is regulated by the Back Creek Pump Storage project and is extremely low during the summer months Most of the private property is posted. Forest and agricultural practices are evident within the stream corridor. Water quality is average to good. The segment is suitable for fish and wildlife propagation and some recreational activities.

Eligibility of Segment B by.

Scenic Value· Segment B of Back Creek is typical of many streams in the area. It is an attractive creek, but has no distinctive or outstanding features The stream is shallow with small pools with a gradual gradient. The current is fairly slow with uniform flow characteristics. During storm periods and when water is released from the pump storage lake, the rate of flow increases. The gently rolling valley is bordered by steep mountain terrain and varies in width. The forest cover consists of mixed hardwoods and pine with common understory species. Open farm land borders the creek in many locations A Class B-Common rating is assigned for scenic values.

Recreational Value. Current recreation use includes swimming, canoeing and fishing by adjacent landowners. Virginia Power has developed a trout fishery and recreation facilities along this segment and provides public access to the river along the upper mile of the segment. This segment is not considered navigable. A Class B-Common rating is assigned for recreational values.

Geologic Value: This segment has no unusual rock outcroppings or other geologic features. The corridor consists primarily of farm land and forest land typical of the area. A Class C-Minimal rating is assigned to the geologic values.

Fish and Wildlife Values: This segment of Back Creek supports a trout fishery from the dam, downstream for one mile. The area provides habitat for wildlife species typical of the Forest. A Class B-Common rating is assigned to the fish and wildlife values.

Historic and Cultural Values: There are known prehistoric and historic sites located along this segment. Information on these sites is documented in studies conducted by the Archaeology Laboratory at James Madison University. Additional sites probably exist. A Class A-Distinctive rating is assigned to the historic and cultural values.

Eligibility Determination:

Segment B of Back Creek is eligible for designation under the Wild and Scenic Rivers Act because it is free-flowing and has outstandingly remarkable historic and cultural values.

Classification Determination:

Because Segment B of Back Creek is eligible for designation, it is necessary to determine the classification that would result from designation. According to the criteria in FSH 1909, Chapter 8, the entire 9.96 miles can qualify for inclusion in the system under the recreational classification. This determination is based primarily on the fact that much of the private land adjacent to the river contains residential structures and agricultural facilities.

Segment C - Back Creek Pump Storage Project to Headwaters (17.24 miles)

The majority of this 17.24-mile segment is in Highland County; approximately 1 5 miles are located in Bath County. The portion in Highland County serves as the Forest boundary. This entire segment has been extensively channelized as a result of the floods of 1969, 1972, and 1985. This segment is not considered navigable. The stream is small with low rates of flow except during major storm events There is no National Forest System land along this segment. State roads parallel and cross this segment in several locations. The stream is free-flowing.

Eligibility of Segment C by Value:

Scenic Value. Segment C of Back Creek is attractive, but has no features that rate as distinctive or outstanding. The stream is shallow with a few small pools and a gradual gradient. The current is fairly slow with uniform flow characteristics. During storm periods, the rate of flow increases considerably The gently rolling valley is bordered by steep mountains that vary the width of the valley The forest cover is typical mixed hardwoods and pine with common understory species. There is a lot of open farm land adjacent to the Creek. A Class C-Minimal rating is assigned for scenic values.

Recreational Value: Current recreation use is limited to swimming and fishing by adjacent landowners. This segment is not considered navigable. Public access is not available on this segment. A Class C-Minimal rating is assigned for recreational values.

Geologic Value: This segment has no unusual rock outcroppings or other geologic features. The corridor consists of farm land and forest land typical of the area. A Class C-Minimal rating is assigned to the geologic values.

Fish and Wildlife Values: This segment does not support a sport fishery. The area provides habitat for wildlife species typical of the Forest. A Class C-Minimal rating is assigned to the fish and wildlife values.

Historic and Cultural Values: There are no known prehistoric or historic sites along this segment, but there is a probability that prehistoric sites do exist within the corridor. Since no systematic survey has been conducted along this section, a Class B-Common rating is assigned to the historic and cultural values.

Eligibility Determination:

Segment C of Back Creek is not eligible for designation under the National Wild and Scenic Rivers Act due to the amount of disturbance to the stream channel and the lack of outstandingly remarkable values For these reasons, this segment will not be studied further for designation under the Wild and Scenic River Act.

BULLPASTURE RIVER

The Bullpasture River is divided into two sections for purposes of this evaluation. The Bullpasture is described from its confluence with the Cowpasture River north to its headwaters. There is no federal land ownership along the Bullpasture River. The lower two miles of the Bullpasture are located in Bath County with the remainder in Highland county. A total of 18 miles is studied for eligibility for the National Wild and Scenic River System.

Segment A - The Bullpasture Gorge.

There is no federal ownership along this 3-mile segment of the Bullpasture River. The segment stretches from the confluence with the Cowpasture River to a ford where Route 609 departs from Route 678. The majority of this segment is in Bath County and is inside the Forest boundary. The gorge is scenic with large boulders and cliffs and presents a challenge to the white-water enthusiast This area is stocked with trout under the state put-and-take system.

Eligibility of Segment A by:

Scenic Value: The section of the Bullpasture River in the gorge contains rock bluffs and large boulders. The stream is typically shallow and small. The rate of flow can vary greatly

with periods of rain and drought. For the most part, however, it is relatively slow. There is a fairly steep gradient through this section. Forest types include mixed hardwoods and some pine and hemlock. The paved state road is adjacent to the stream and is very evident from the stream. A Class A-Distinctive rating is assigned to the scenic values.

Recreational Value: This section is stocked by the VDGIF with trout under the put-and-take program. According to the book *Virginia White Water* by H. Roger Corbett, this section offers big white-water consisting of Class 3, 4 and 5 rapids. The gorge is not navigable year-round and is considered dangerous during periods of high water. The stream is shallow with large boulders in this section. A Class A-Distinctive rating is assigned to the recreational values.

Geologic Value: This section has rock bluffs and cliffs. There are large boulders in the stream A Class A-Distinctive rating is assigned to the geologic values

Fish and Wildlife Values: This section is stocked with trout by the VDGIF under the put-and take program. The wildlife species of the area is typical of the Forest. A Class B-Common rating is assigned to the fish and wildlife values.

Historic and Cultural Values. There are no known prehistoric or historical sites along this section. No survey has been conducted along the Bullpasture River. A Class B-Common rating is assigned to the historic and cultural values.

Eligibility Determination:

Section A of the Bullpasture River, including the Bullpasture Gorge, is eligible for designation under the National Wild and Scenic Rivers Act because it is free-flowing and has outstandingly remarkable scenic, recreational, and geologic values.

Classification Determination·

Because Segment A is eligible for designation, it is necessary to determine the classification that would result from designation According to the criteria established in FSH 1909, Chapter 8, the entire three-mile segment qualifies under the scenic classification The determination is based on the fact that the segment has outstanding scenic values, but is bordered by paved Route 678

Segment B - North of the Bullpasture Gorge to the headwaters

This 15-mile segment of the Bullpasture River has been heavily channelized from the Highland Wildlife Management Area to the headwaters. There are paved state roads adjacent to the stream and sections of the road have heavy limestone rip-rap for flood protection Due to disturbances including channelization, Segment B does not qualify under the National Wild and Scenic Rivers Act.

CACAPON - LOST RIVER

The 89-mile segment described in the Nationwide Rivers Inventory begins at the dam below Great Cacapon and ends at Baker, West Virginia. A segment of this river is a congressionally mandated study river. The study was completed by the U.S Department of Interior, Park Service, in the summer of 1982. The Department of Interior study team found the river unsuitable because of lack of public support for designation and did not recommend inclusion in the national system.

Based on findings in the National Park System report, the Cacapon-Lost River will not be considered further.

CEDAR CREEK

This 25-mile evaluation segment of Cedar Creek is located in Shenandoah and Frederick counties. The section begins at the State Route 622 bridge and ends at its headwaters in the Lee District of the Forest. The majority of land along the creek is privately owned. The Forest Service owns land adjacent to the headwaters for a total of 2.65 miles. The majority of the stream is located outside the Forest boundary.

Cedar Creek is a small stream with sections in its headwaters that go dry every year Private property within the corridor is largely undeveloped and is a mixture of agriculture and forest land. Forest and agricultural practices are evident along most of the stream. Development on the private property is starting to occur. There are houses, cabins, and two private fish hatcheries Most private property is posted. Water quality is average. A small native brook trout population is in the extreme headwaters The stream has been stocked with trout under the state's put-and-take program in the past, but due to littering, parking problems, and acid deposition, the program was halted Both regular and low-water bridges cross the stream.

Eligibility of the 25-mile Segment by·

Scenic Value. Cedar Creek flows over gently rolling terrain where mountains are visible in the background. There are no distinctive or outstanding features within the corridor. The stream is relatively small and shallow at the headwaters, but becomes larger with pools toward the end of the evaluation segment The majority of the reach on the Forest goes dry during the summer. Because of the gently rolling terrain, the creek has uniform flow characteristics. During storm periods, the flow is faster and higher. The adjacent forest cover is typical mixed hardwood and pine with common understory species. A Class B-Common rating is assigned to scenic values.

Recreational Value· Current recreation use consists of fishing, canoeing, and kayaking. Fishing activity is curtailed since the stream is no longer stocked under the state's put-and-take program. There is some bass fishing along the lower reach outside of the Forest boundary. Most of the private property along the creek is posted so there is little public

access outside the Forest The stream is not classified as navigable A Class B-Common rating is assigned to the recreational values.

Geologic Value: There are no unusual or outstanding rock outcroppings, cliffs or other geological formations along the stream. The "Three High Heads" of Paddy Mountain are visible from Cedar Creek Valley. A Class B-Common rating is assigned to the geologic values.

Fish and Wildlife Values: The stream is no longer stocked with trout under the state's put-and-take program. Smallmouth bass, rock bass, sunfish, and some other species occur in the lower reach of the stream. There is a small population of brook trout in the headwaters. The headwaters are badly impacted by acid deposition. The area provides habitat for wildlife species typical of the Forest. A Class C-Minimal rating is assigned to the fish and wildlife values.

Historic and Cultural Values: Stevens Fort, an old iron furnace, and two tannery sites are located within the corridor and have the potential for historical significance. A Class A-Distinctive rating is assigned to the historic and cultural values.

Eligibility Determination:

With the exception of the intermittent headwaters, Cedar Creek is eligible for designation under the National Wild and Scenic Rivers Act. The intermittent headwaters are defined as that section of the creek from its headwaters down to where the creek crosses the boundary between the Forest and private land at approximately the 1,330-foot contour. The creek is free-flowing and has outstandingly remarkable historic and cultural values.

Classification Determination:

Because Cedar Creek is eligible for designation, it is necessary to determine the classification that could result from designation. According to the criteria in FSH 1909, Chapter 8, a total of 20 miles qualifies for inclusion in the system under the scenic classification.

COWPASTURE RIVER

For evaluation purposes, the Cowpasture River is divided into four segments. The Cowpasture is described in this report from its confluence with the James River to its headwaters to the north. The Forest Service currently owns a total of 3.5 miles of land on one side of the river only. This 3.5 miles of riverbank land is divided among 10 tracts and is not contiguous. Forest Service ownership of the land on both sides of the river totals 4.5 miles on three tracts which are not contiguous. A total of 78.11 miles is studied for eligibility for the National Wild and Scenic River System.

The State of Virginia selected the portion of the Cowpasture River from Panta to Route 42 for further evaluation as a component of the Virginia Scenic Rivers System. Banks and stream are subject to riparian

rights since the majority of the stream is not declared navigable. The Virginia Department of Game and Inland Fisheries (VDGIF) states that the section from the U.S. Route 60 bridge to the confluence with the Jackson River is declared navigable.

Citizen interest in designation of the Cowpasture River is strong. The Cowpasture Property Owners Association is a group of landowners who organized for the purpose of participating in the designation process.

Segment A - Confluence with the Jackson River to Route 42 Bridge

The majority of this 16-mile segment is within Alleghany County. National Forest System land borders the river on one side only for three miles and at three different locations. The VDGIF states that the portion between U. S. Route 60 bridge and the confluence with the Jackson River is navigable. There are no impoundments along this segment. Portions of Segment A are paralleled by roads, including State Highway (SH) 42. It is crossed by roads and/or highways four times, including Interstate 64, and by a railroad line three times. There is no developed trail access to the river. Most of the shoreline along this segment currently consists of forest and agricultural land where management of these lands is evident. There is some development along the river including cabins, houses, and a private campground. Most of the adjacent private land is posted against trespassing. This segment is suitable for fish and wildlife propagation, wading, and canoeing.

Eligibility of Segment A by:

Scenic Value: Segment A of the Cowpasture River is an attractive river that is typical of rivers within the George Washington National Forest and the surrounding area. It has no features that rate as distinctive or outstanding. The stream is shallow, medium in width with some large pools, and has a gradual gradient. The current is fairly slow with no waterfalls, cascades of significant whitewater. The valley bottom is gently rolling with steep mountain terrain bordering it on one side. Several shale bluffs are evident from the river. Forest cover along the river is mixed hardwood and pine with common understory species. A Class B-Common rating is assigned to the scenic values.

Recreational Value: Current recreation use of Segment A is limited to fishing, canoeing, tubing, and swimming by adjacent landowners. The section between the U.S. Route 60 bridge and the confluence with the Jackson River is considered navigable by the VDGIF. This segment receives high use by tubers and canoeists. Public access is limited to two locations: from the Route 42 bridge and from national forest land on the Evans Tract off State Road 633. This limited access keeps river use down. A Class A-Distinctive rating is assigned to the recreational values.

Geologic Value: This segment has no unusual rock outcroppings. Two shale bluffs are visible from a short segment of the stream. The corridor consists of farm land and forest types typical of the George Washington National Forest. A Class C-Minimal rating is assigned to the geologic values.

Fish and Wildlife Values: This segment supports a sport fishery of smallmouth bass and muskellunge with other species such as sunfish. Spawning muskellunge -- a rarity in the state -- are present in this segment. The area provides habitat for wildlife species typical of the Forest A Class A-Distinctive rating is assigned to the fish and wildlife values.

Historic and Cultural Values: There are known prehistoric sites on the main terraces of the river on National Forest System land. It is likely that additional prehistoric sites exist on private property along the river. Evidence of an antebellum mansion can be found on the government owned Evans (#1657) Tract. Again, there is a high probability that undiscovered and potentially significant prehistoric sites exist within this river corridor. A Class A-Distinctive rating is assigned to the historic and cultural values.

Eligibility Determination:

Segment A of the Cowpasture River is eligible for designation under the Wild and Scenic Rivers Act. It is free-flowing and determined to have outstandingly remarkable recreational and fish and wildlife values.

Classification Determination:

Because Segment A of the Cowpasture River is eligible for wild and scenic river system, it is necessary to determine its potential classification as either wild, scenic, or recreational. According to criteria in FSH 1909, Chapter 8, the entire 16 miles qualifies for inclusion in the system under the recreational classification. This determination is based primarily on the fact that several major highways and railroad bridges cross and parallel this section of the river.

Segment B - From Route 42 Bridge to the confluence with the Bullpasture River

This 48.11-mile segment is located entirely within Bath County. National Forest System land borders on one side only for 4.33 miles and is spread out over seven locations. Forest Service lands border both sides for 4.28 miles at two locations There is one small dam near Millboro Springs, a few low-water bridges and a few swinging foot-bridges, including one on national forest land Portions of Segment B are paralleled by roads Other roads provide access to the river. There is one foot-trail on National Forest System land that provides access to the river.

The shoreline is largely undeveloped and is a mixture of forested and agricultural land. The development that exists includes cabins, houses, and tilled farm land. The majority of the adjacent private land is posted. Forest and agricultural practices are evident within the stream corridor. The segment is suitable for fish and wildlife propagation, wading, canoeing, and other uses Water quality is average. Three locations provide public access along this segment. This segment has not been declared navigable

Eligibility of Segment B by:

Scenic Value: Segment B of the Cowpasture River is typical of many rivers in the Forest and the area. The stream is small-to-medium in width and shallow, with some large pools of water. It has a gradual gradient and no stretches of whitewater. The current is fairly slow with uniform flow characteristics. The valley bottom is gently rolling with steep mountain terrain bordering one side. No cliffs or other rock formations are evident along this segment. The forest cover is typical mixed hardwood and pine with common understory species. A Class B-Common rating is assigned to the scenic values.

Recreational Value: Current recreation use of Segment B consists of fishing, canoeing, tubing, and swimming by adjacent landowners and the general public along tracts owned by the Forest Service. Public access is limited. This river segment has not been declared navigable. Due to these factors, recreational use is limited A Class B-Common rating is assigned to the recreational values

Geologic Value: This segment has no unusual rock outcroppings The corridor consists of farm land and forest typical of the George Washington National Forest A Class C-Minimal rating is assigned to the geologic values.

Fish and Wildlife Values: This segment supports a sport fishery of smallmouth bass, muskellunge, and other species such as sunfish. Spawning muskellunge--a rarity in the state--are present in this segment. The area provides habitat for wildlife species typical of the Forest. The majority of the private property along this segment is posted and severely limits fishing-and-wildlife-related access. A Class A-Distinctive rating is assigned to the fish and wildlife values

Historic and Cultural Values: There are known prehistoric archeological sites on the Forest. There is a high probability that additional prehistoric sites exist in the corridor on both private and federal lands. A known historic site exists on the Forest-Service-owned Wallace Tract. The tract includes an old brick house which may have historical value and may qualify for the National Register of Historical Places. Another historical site with potential exists on the Walton Tract. The tract contains the remains of several old homesites. Dickinson Fort is another potentially significant site located within the corridor. A Class A-Distinctive rating is assigned to the historic and cultural values.

Eligibility Determination:

Segment B of the Cowpasture River is eligible for designation under the National Wild and Scenic Rivers Act It is free-flowing and has outstandingly remarkable fish and wildlife and historic and cultural values.

Classification Determination:

Because Segment B of the Cowpasture River is eligible for designation, it is necessary to determine its potential classification as either wild, scenic, or recreational. According to the criteria in FSH 1909, Chapter 8, the entire 48.11-mile segment qualifies for inclusion in the system under the recreational classification. This classification is based on the fact that several roads cross the river and that concentrated development exists along the river in the area of Millboro Springs. In addition, there is a small dam on the river in the Millboro Springs area.

Segment C - Confluence with Bullpasture River to Patna

The majority of this six-mile segment is within Highland County. It is not considered navigable. The river is free-flowing, but small. Segment C is inside Forest boundaries. There is no public access and the majority of the adjacent private property is posted. Roads parallel and cross the river at several locations. Upper reaches of the river go dry during extended dry periods. Adjacent land is farm land with sections of hardwood and pine and is used for pasture, primarily. Little opportunity exists for fish propagation, wading, canoeing, and other forms of recreation. The river passes through a section of a state wildlife management area for about 1.5 miles. Of note, the section downstream from Panta to the end of segment C and part of Segment B has been selected by the state for further evaluation as part of the Virginia Scenic Rivers System.

Eligibility of Segment C by:

Scenic Value: Segment C is typical of the upper reaches of rivers in the area. It is attractive, but has no distinctive or outstanding features. It is small-to-medium in size with low-flow except during major storm periods. The current is fairly slow with uniform flow characteristics. The topography of the valley is gently rolling with steep bordering mountains. No rock outcroppings are evident. The forest cover is typical hardwood and pine with common understory species. A state highway parallels the stream and several houses are scattered along its banks. A Class C-Minimal rating is assigned to the scenic values.

Recreational Value: Current recreation use is limited to adjacent landowners and consists of fishing and swimming. There is no public access to Segment C. The stream does not have sufficient flow for boating except during major storm periods. A Class C-Minimal rating is assigned to the recreational values.

Geologic Value: This section has no unusual rock outcroppings except near the confluence with the Bullpasture River. The corridor consists of farm land and forest types typical of the area. A Class C- Minimal rating is assigned to the geologic values.

Fish and Wildlife Value: This section does not support a sport fishery. The area provides habitat for wildlife species typical of the area. A Class C-Minimal rating is assigned to the fish and wildlife values.

Historic and Cultural Value: There are no known archeological or historical sites along this section, but there is a probability for archeological sites. Since no survey has been conducted, a Class B-Common rating is assigned.

Eligibility Determination:

With no outstandingly remarkable values present, Segment C of the Cowpasture River is not eligible for designation under the National Wild and Scenic Rivers Act. Segment C will not be studied further for designation.

Segment D - Patna to the headwaters

The majority of this 8-mile segment is within Highland County. From Patna to the headwaters, the stream has been channelized in many locations. Channelization was done in response to the floods of 1969, 1972, and 1985. Segment D is not considered navigable. The river is free-flowing, but small in size. This segment is within the Forest boundary. There is no public access and the majority of adjacent private property is posted. Roads parallel and cross the river at several locations. Upper reaches of the river go dry during extended dry periods. Adjacent land is farm land that is used primarily for pasture, with sections of hardwood and pine woodlands. Little opportunity exists for fish propagation, wading, canoeing, or other forms of recreation.

Due to channelization of the river, the section from Panta to the headwaters will not qualify for wild and scenic river designation and will not be considered further.

DRY RIVER

This stream is not on the National Rivers Inventory. In response to an appeal by the American Rivers Conservation Council, this river was reviewed on-the-ground by the Forest and American Rivers. A 22-mile segment of the Dry River was studied, including the portion from the headwaters to where the river exits the Forest boundary. This river received major damage during the floods of 1969, 1972, 1985, and several earlier floods. The river is heavily channelized. There are some impoundments on the river, including the city of Harrisonburg water supply diversion dam at Riven Rock Park and dams on the upper mainstem, Skidmore Fork, and Dry Run.

Because of the extensive channelization, Dry River is not free-flowing and is not eligible for inclusion in the wild and scenic river system.

IRISH CREEK

This stream is not on the National Rivers Inventory. In response to an appeal by the American Rivers Conservation Council, Irish Creek was reviewed on-the-ground by representatives of the George Washington National Forest and American Rivers. An 8.5-mile segment was studied, from the headwaters to where Irish Creek exits the Forest boundary. An on-the-ground evaluation of this stream showed that it was heavily damaged during the floods of 1969, 1972, and 1985. Extensive channelization and gabion structures

dominate the entire evaluation segment. Because of the extensive channelization, Irish Creek is not free-flowing and is not eligible for inclusion in the wild and scenic river system.

JACKSON RIVER

The 42.69 miles of the Jackson River being considered here was divided into four segments for evaluation purposes. The Jackson is described in this report from its headwaters south to an area called Clearwater Park, located just north of Covington, Virginia. Forest Service ownership along the Jackson River is non-contiguous Segments of the Jackson have been evaluated by the Virginia Commission of Outdoor Recreation and found worthy of inclusion in the Virginia Scenic River System. Citizen interest in any proposed wild and scenic river designations would be extremely high.

Segment A - U.S. Forest Service lands at the northern boundary of the Hidden Valley Tract to the headwaters

This segment is within Bath and Highland counties and contains approximately 14 3 miles. The majority of property along this segment is privately-owned and 75 percent of this segment is outside the Forest boundary. The private property is posted. This segment is not considered navigable. The portion in Highland County is outside the Forest boundary This segment touches Forest land at two locations for an approximate distance of 0.66 miles in Bath County near Star Chapel. This segment is paralleled by State Highway 220 and is bridged by Highway 220 and county roads 607 (twice), 606, and 608. The segment was heavily channelized in several locations after the floods of 1969, 1972, and 1985. The disturbed sections are short, but scattered over the entire length

Eligibility of Segment A by:

Scenic Value: Segment A of the Jackson River is typical of the rivers in this part of the state. Although attractive, it has no distinctive or outstanding features. The stream is medium-to-small and for the most part, shallow. A few pools are scattered along this reach. The current is slow, with uniform flow characteristics. The valley is gently rolling with steep mountain terrain on one side near the river. There are no rock cliffs, ledges or shale bluffs evident from the stream. The forest cover is typical mixed hardwood and pine with common understory plants. The majority of the bordering land is private farming with pasture land along the river. Many of these bordering properties are developed with houses, barns, bridges, and other structures. This segment is paralleled by State Highway 220. A Class C-Minimal rating is assigned to the scenic values

Recreational Value: Current recreation use of Segment A is limited to fishing and swimming by adjacent landowners. This segment is not considered navigable. A Class C-Minimal rating is assigned to the recreational values

Geologic Value· This segment has no unusual or outstanding geological features. The corridor consists of farm land and forests typical of the GWNF area. A Class C-Minimal rating is assigned to the geologic values.

Fish and Wildlife Values: Parts of this segment support smallmouth bass, sunfish and other species Fishing access is limited due to adjacent private property. The area provides habitat for wildlife species typical of the Forest. A Class C-Minimal rating is assigned to the fish and wildlife values.

Historic and Cultural Values: Although a systematic survey has not been conducted along this segment, there are known prehistoric sites located on private land adjacent to the river. Because these sites have not been evaluated for significance, a Class B-Common rating is assigned to the historic and cultural values.

Eligibility Determination:

Due to channelization and development along the river, Segment A of the Jackson River is not eligible for designation. This same conclusion was reached by the Virginia Commission of Outdoor Recreation in their study. For these reasons this segment will not be evaluated further for designation under the National Wild and Scenic Rivers Act.

Segment B - From Hidden Valley southern boundary to U.S. Forest Service lands at the northern boundary of the Hidden Valley Tract (7 06 miles)

This 7.06-mile segment is located in Bath County. A total of 6.56 miles of this segment is located on the Forest. Property along the remaining .5 miles is posted. This section is not legally declared navigable, however, the section inside the Forest is in public ownership and, therefore, is de facto navigable. Public vehicle access is available at either end. A jeep trail parallels a portion of the stream and is used by hikers and for administrative purposes by the Forest Service. Most of the shoreline is forested. One low-water bridge crosses the stream at the Warwick Mansion A swinging foot-bridge on the Forest crosses the stream above Muddy Run. There are a few open fields and structures adjacent to or bordering this segment of the river.

Eligibility of Segment B by:

Scenic Value: Segment B of the Jackson River is an attractive river. Forest cover along the river is nearly continuous Open fields border the river in several locations, adding variety to the environment. There is a variety of plant species, including large trees. The streambed is medium in width. The rate of flow is medium and there is little-to-no white-water, except during storm periods. Several structures are visible within the river corridor. The old jeep road is not highly visible from the stream. There is one low water bridge. There are flats adjacent to the stream, with some steep side slopes to add to the variety. A Class A-Distinctive rating is assigned to the scenic values.

Recreational Value: Current recreation use consists of trout fishing, wading, canoeing, hunting, and hiking. Most land along this segment is public, under Forest Service management, accessible, and available for recreational use. Much of the length of this segment is a walk-in fishery, providing a somewhat unique recreation opportunity for the area. Out-

standing white-water canoeing and kayaking opportunities exist along this segment in Hidden Valley. A Class A-Distinctive rating is assigned to the recreational values.

Geologic Value: A few rock outcroppings are present, but most are not visible from the river. The corridor consists primarily of forest interspersed with open fields. Forest types along the river are typical of the George Washington National Forest. A Class B-Common rating is assigned to the geologic values.

Fish and Wildlife Values: This segment is stocked with trout by the Virginia Division of Game and Inland Fisheries (VDGIF) under the state's put-and-take system This section of the river is an otter re-introduction site, one of several in Virginia. A Class A-Distinctive rating is assigned to the fish and wildlife values.

Historic and Cultural Values: This segment contains the Warwick Mansion that is on the National Register of Historic Places. A low-water bridge across the river provides access to the mansion. A rock shelter with a significant prehistoric component is located in the corridor along this segment and is on the National Register of Historic Places. There is a high probability that additional archeological sites exist within this corridor. A Class A-Distinctive rating is assigned to the historic and cultural values.

Eligibility Determination:

Segment B of the Jackson River is eligible for designation under the National Wild and Scenic Rivers Act because it is free-flowing and has outstandingly remarkable scenic, recreational, fish and wildlife, and historic and cultural values.

Classification Determination:

Because Segment B of the Jackson River is eligible for designation, it is necessary to determine the classification that could result from designation. According to the criteria in FSH 1909, Chapter 8, the entire 7.06 miles qualifies for designation under the scenic classification. The segment has outstanding scenic qualities and is bordered and accessed by paved state highways.

Segment C - Hidden Valley to McClintic Bridge (8.33 miles)

This 8.33-mile segment is bordered almost entirely by private property. The exception is 0.27 miles of Forest ownership. While there are numerous access points to the river, most are located on posted private property and are not available to the general public. Many private roads parallel the stream. A few structural improvements such as farm buildings, houses, and hunt cabins exist along the stream. Existing use along the river consists primarily of hunting camps and agriculture. The shoreline is a mixture of forest land and open fields. This segment is suitable for fish and wildlife propagation, wading, canoeing, and other uses. The water clarity ranges from average to good. This segment is not considered navigable, therefore, public access to the river is controlled by the landowners

Eligibility of Segment C by:

Scenic Value: Segment C of the Jackson River is an attractive area. The size ranges from small-to-medium in width and is mostly shallow with some large pools. The rate of flow ranges from slow to fast. There are large boulders in some sections of the stream channel and cliffs are evident in some locations. Topography ranges from gently-rolling valley to steep-sided gorge. Richardson Gorge has outstanding scenery. Roads are evident along sections of this segment. The forest cover consists of hardwoods, hemlock, some pine. Understory species are those common to the GW. A Class A-Distinctive rating is assigned to the scenic values.

Recreational Value: Current recreation along Segment C consists of fishing, canoeing, kayaking, and swimming by adjacent landowners and guests. There is little public land along this segment The segment is not considered navigable and access is controlled by adjacent landowners who have posted their property. Through Richardson Gorge, the river drops 40 feet per mile for two miles, making it an excellent river for white-water enthusiasts. There is some trout fishing in this segment. A Class A-Distinctive rating is assigned to the recreational values. If access problems can be resolved, this segment has excellent potential for public recreation use.

Geologic Value: There are several rock outcroppings along this segment. Richardson Gorge has many interesting and beautiful geological formations. A Class A-Distinctive rating is assigned to the geologic values

Fish and Wildlife Values: Segment C contains smallmouth bass and bluegills as well as stocked and wild trout. The area is posted and access for fishing is not available to the general public There is evidence that the special strain of rainbow trout stocked in Lake Moomaw are beginning to make spawning runs into this section of the river. If this spawning run continues to build, this would dramatically increase the fishery value of this section. This area provides habitat for wildlife species that are typical of the Forest. A Class B-Common rating is assigned to the fish and wildlife values.

Historic and Cultural Values: There are known historic and prehistoric sites along this segment These include Fort Dinwiddie and the Hirsch Mound, both located on private land. There is a high probability that additional prehistoric sites exist A Class A-Distinctive rating is assigned to the historic and cultural values

Eligibility Determination.

Segment C of the Jackson River is eligible for designation under the National Wild and Scenic Rivers Act because it is free-flowing and has outstandingly remarkable scenic, recreational, geologic, and historic and cultural values.

Classification Determination:

Because Segment C of the Jackson River is eligible for designation, it is necessary to determine the classification that could result from designation. According to the criteria in FSH 1909, Chapter 8, the entire 8.33 miles qualifies for inclusion in the system under the scenic classification. This determination is based primarily on the fact that development along the river is sparse and roads are inconspicuous

Segment D - Gathright Dam to Clearwater Park (13.0 miles)

This segment is 13.0 miles long. It begins at Gathright Dam and ends at the bridge where State Route 687 crosses the river at Clearwater Park. The majority of the river frontage is privately owned and posted. The first 1/2-mile is bordered by public land administered by the Corps of Engineers. There is one canoe access point on Corps lands. The Forest Service administers five access points along this segment of the river. These are located on small tracts purchased by the Corps of Engineers and later transferred to the Forest Service to provide public access to the river. This segment was declared navigable by the federal courts in 1982. In contrast to the federal court's determination that this segment is navigable, adjacent landowners maintain that they own the bottom of the river. They do not permit fishing or recreation access to the river by the general public. Only two of the publicly owned access points have been developed to date.

County and private roads parallel the river and county roads 687 and 638 cross it An abandoned railroad grade parallels the segment for its entire length. Several farms and private homes are located along this segment, including a few private subdivisions. This segment of the river is used by canoeists, kayakers, tubers, and swimmers.

Eligibility of Segment D by:

Scenic Value: Segment D of the Jackson River is an attractive stream. It is medium in size and the depth ranges from shallow to deep where the river pools. The rate of flow ranges from average to fast and is regulated by the discharge at Gathright Dam. In some sections, there are large boulders and rapids Shale cliffs are evident at three or four locations. The river valley is gently rolling and bordered by steep mountains. Roads parallel the river and are visible from the river along most of this segment. Several houses are located along the river. Forest cover is typical of the area and consists of mixed hardwoods and pine, including several hemlock groves. The understory species are common to the forest type. A Class B-Common rating is assigned to the scenic values.

Recreational Value Canoeing, kayaking, and tubing are becoming popular along this segment of the Jackson River Fishing and swimming are popular in a few locations, but adjacent landowners discourage these uses. This segment is navigable and has six public access points Most of the private property is posted. Bass fishing is good and the VDGIF plans to turn this segment into trout fishing waters. VDGIF maintains that this could be one of the best trout streams in the East due to Gathright Dam and Lake Moomaw and the ability

to control temperature and oxygen levels of the water. This segment has good potential for river recreation use. A Class A-Distinctive rating is assigned to the recreational values.

Geologic Value: At least four outstanding shale and limestone bluffs within the corridor are visible from this segment. Many users consider them outstanding geological features. A Class A-Distinctive rating is assigned to the geologic values.

Fish and Wildlife Values: At present, there is an outstanding fishery in this segment. The river contains smallmouth bass and panfish. A trout fishery is being developed. The river has been legally declared navigable, but adjacent landowners maintain they own the bottom of the river. Due to Lake Moomaw and Gathright Dam, water flow is regulated and the released water is typically colder than it would be without the release from the lake. The ability to release cold water into this segment provides for outstanding trout waters. The corridor provides habitat for wildlife species typical of the Forest. With the trout fishery being developed, this segment qualifies for a Class A-Distinctive rating.

Historic and Cultural Values: There are known historic and prehistoric archeological sites along this segment. There is high probability that additional prehistoric sites exist. A Class A-Distinctive rating is assigned to the historic and cultural values.

Eligibility Determination:

Segment D of the Jackson River is eligible for designation under the National Wild and Scenic Rivers Act because it is free-flowing and has outstandingly remarkable historical, cultural, recreational, geologic, and fish and wildlife values.

Classification Determination:

Because Segment D of the Jackson River is eligible for designation, it is necessary to determine the segment's classification. According to the criteria in FSH 1909, Chapter 8, the entire 13.0 miles qualifies for inclusion in the system under the recreational classification This determination is based primarily on the fact that this segment of the river is paralleled by roads and is developed by private landowners.

NORTH RIVER

This evaluation will examine a 16-mile segment of the North River from its headwaters to the point it exits the Forest approximately one mile east of the town of Stokesville, Virginia. The segment is located in Augusta County and Forest ownership of land along the river is almost complete. Private property does border the river for approximately 1.5 miles in the vicinity of Stokesville. The river is small and shallow except during major storm periods. Normally, the current is fairly slow with uniform flow characteristics. Steep mountain terrain is on both sides of the river. State and Forest roads exist in the stream corridor. Portions of the stream are stocked with trout under the state's put-and-take program. Much of the river has been

heavily damaged by the floods of 1969, 1972, and 1985. Floods prior to these resulted in many gabions being installed along sections of the stream. The river is not considered navigable.

Segment A - From the headwaters to North River Campground.

The streambed and channel along the nine-mile section from the headwaters to the North River Campground show heavy flood damage and are channelized with gabions in some locations. Two dams are located within this section. Therefore, this section of the North River cannot be considered free-flowing and does not qualify for eligibility under the Act. As defined in the Act, free-flowing "means existing or flowing in natural condition without impoundment, diversion, straightening, rip-rapping, or other impoundment of the waterway."

Segment B - From North River Campground to Camp May Flather

This section is approximately 5.0 miles long. It is free-flowing and small in size. The average flow is relatively low. Flood damage along this segment is relatively absent. The adjoining property is owned entirely by the Forest Service. The shoreline is undeveloped. Some past forest management practices are evident along a short section of this stream. A Forest Service trail follows this section, part of which is an old jeep road that is used to stock trout. The surrounding forest is typical hardwood and pine with common understory species.

Eligibility of Segment B by:

Scenic Value: Segment B of North River is an attractive segment with many outstanding rock formations and cliffs. The stream is typically shallow as it flows between a series of small pools. During periods of high water, usually in the spring and following moderate rains, North River provides a challenging white-water experience, including several Class 4 rapids. The stream flows over varying terrain, which adds to its attractiveness. Located in the North River gorge, this section is bordered by steep, mountainous terrain on both sides. A Forest Service trail, once a jeep trail, follows this section and crosses it at nine locations. The trail is still used by VDGIF vehicles to stock trout in the spring. There are signs of timber cutting in the corridor. The cutting was to salvage ice-damaged timber and most was on an individual tree selection basis. One small clearcut is evident. The surrounding forest cover is typical mixed hardwood and pine with common understory species. A Class A-Distinctive rating is assigned to the scenic values.

Recreational Value: Current recreation use consists of hunting, fishing, hiking, and seasonal canoeing and kayaking. During high water, this section is capable of providing good white-water canoeing and kayaking. This section traverses public land and has adequate access at both ends. The North River Gorge hiking trail receives heavy use. Camping is available at the North River Campground. A Class A-Distinctive rating is assigned to the recreational values.

Geologic Value: This segment through the North River Gorge contains several cliffs and outstanding rock formations. A Class A-Distinctive rating is assigned to the geologic values.

Fish and Wildlife Values: This segment is stocked in the spring with trout under the state's put-and-take program. It is also stocked in the fall if there is enough water to support fish. Several wildlife clearings are in the North River Gorge. For the most part, they are located away from the streambed and are not readily visible from the river. The area provides habitat for wildlife species typical of the Forest. A Class B-Common rating is assigned to the fish and wildlife values.

Historic and Cultural Values: There are no known prehistoric archeological sites along this segment. Camp May Flather dates back to the 1930s and North River Campground is an old CCC camp site. There is an old logging railroad grade in the gorge area. A Class A-Distinctive rating is assigned to the historic and cultural values.

Eligibility Determination:

The North River Gorge area of North River is eligible for designation under the National Wild and Scenic Rivers Act. It is free-flowing and has outstandingly remarkable scenic, recreation, geologic, historic, and cultural values.

Classification Determination:

Because the North River Gorge segment of North River is eligible for designation, it is necessary to determine the classification that could result from designation. According to criteria in FSH 1909, Chapter 8, a total of 5.0 miles qualifies for inclusion in the system under the scenic classification.

Segment C - From Camp May Flather to the Forest's proclamation boundary.

This 2-mile section is located below the Forest boundary and crosses private property. The streambed and channel contain extensive flood-related damage and channelization. As with Segment A, this section of the North River cannot be considered free-flowing and therefore, is not eligible under the Act.

PASSAGE CREEK

Passage Creek is divided into three segments for evaluation purposes. Passage Creek is described in this *report from its headwaters north to its confluence with North Fork Shenandoah River. This evaluation* covers 34.5 miles from the confluence of the North Fork of the Shenandoah River to the beginning point of perennial stream flow. Within this 34.5-mile segment, the Forest Service owns 0.9 miles of land on one side and 9.7 miles on both sides of the creek. The majority of Passage Creek is located within the ridge commonly referred to as Massanutten Mountain. It flows north through Fort Valley and into the North Fork of the Shenandoah River. It is not considered navigable. State of Virginia studies do not consider Passage Creek eligible the Virginia Scenic Rivers System.

Segment A - Headwaters to State Route 730 (6.3 miles)

This 6 3-mile segment is bordered on both sides by National Forest System land except for 0.9 miles of private property on one bank. This segment is located in Page and Shenandoah counties. Segment A is a very small stream with low flows and a slow moving current. During periods of drought, some sections of Segment A become dry. The stream is free-flowing and the shoreline is entirely wooded. Crisman Hollow Road parallels the entire segment. Hiking trails parallel and cross the creek at several locations. Forest management practices are evident along several sections of this segment. Part of this segment is stocked by the VDGIF under the Virginia's put-and-take program. Sections are suitable for wading and trout fishing. Water quality is average.

Eligibility of Segment A by:

Scenic Value· Segment A of Passage Creek is a typical small mountain stream. It has no distinctive or outstanding features. The stream is small and shallow, following a gradual gradient. Sections go dry during periods of drought. The current is slow with uniform flow characteristics. Steep mountain slopes border the creek on both sides. From a visual standpoint, there are no outstanding rock formations, cliffs, or bluffs. Forest cover along the creek consists of mixed hardwood and pine The understory consists of common species. A Class C-Minimal rating is assigned to the scenic values.

Recreational Value: Current recreation use consists of wading and trout fishing under the put-and-take program. Land based recreation activities that occur in the corridor include hiking and big and small game hunting. A Class C-Minimal rating is assigned to the recreational values.

Geologic Value: There are no outstanding geological formations within the corridor. A Class C-Minimal rating is assigned to the geologic values.

Fish and Wildlife Values: This segment is stocked with trout by the VDGIF put-and-take program. The area provides habitat for wildlife species typical of the Forest. A Class C-Minimal rating is assigned to the fish and wildlife values.

Historic and Cultural Values: There are no known archeological sites in the corridor of this segment Crisman Hollow Road is one of the many Forest roads constructed by the Civilian Conservation Corps (CCC). Camp Roosevelt is located just south of the end of this segment. A Class C-Minimal Rating is assigned to the historic and cultural values.

Eligibility Determination:

Segment A of Passage Creek is not eligible for designation under the National Wild and Scenic Rivers Act. The segment does not have outstandingly remarkable values. For this reason, Segment A will not be studied further for designation under the National Wild and Scenic Rivers Act.

Segment B - From State Route 730 to Forest Boundary

This 21.3-mile segment is located in Shenandoah County. It runs the length of Fort Valley and is bordered entirely by private property. Route 678 parallels this segment of the stream for the entire length. A few roads cross the stream by means of low-water bridges. The corridor consists of agricultural and forest land with several houses and a few subdivisions. It is not considered navigable. Because most of the private property is posted, the stream is not accessible to the general public. The segment is suitable for fish and wildlife propagation, wading, and canoeing during periods of high water. Water quality is average. There are no impoundments.

Eligibility of Segment B by:

Scenic Value: Segment B of Passage Creek is typical of many streams on the George Washington National Forest It is an attractive creek, but has no features that rate as distinctive or outstanding. This is a small stream that meanders through Fort Valley. The stream is shallow with occasional small pools. There are mountains on both sides of the broad, four-mile wide valley. The valley is gently rolling and supports a number of farms and houses. The forest cover is typical mixed hardwoods and some pine, with common understory species. A Class B-Common rating is assigned to the scenic values.

Recreational Value: Current recreation use of Segment B is limited to fishing and swimming by the adjacent landowners. There is some canoeing during periods of high water. The stream is not classified as navigable and use is controlled by the landowners. This reduces the recreational use of the stream A Class B-Common rating is assigned to the recreational values.

Fish and Wildlife Values. This segment supports smallmouth bass and sunfish populations but is not considered a significant sport fishery due to its small size. The area provides habitat for wildlife species typical of the Forest. A Class C-Minimal rating is assigned to the fish and wildlife values.

Geologic Value: This segment has no outstanding visible geological formations. This segment of Passage Creek flows through Fort Valley which is about 22 miles long by four miles wide There are not many natural entrances into the valley. Mountains are visible on both sides. A Class B-Common rating is assigned to the geologic values.

Historic and Cultural Values: Camp Roosevelt, the site of the first Civilian Conservation Corps camp in the nation, is located at the beginning of this segment. Caroline Furnace, an old iron furnace site, is also located near the beginning of this segment. Fort Valley derives its name from and has historical significance relating back to the Revolutionary War period. There are additional known historical sites in this corridor. A Class A-Distinctive rating is assigned to the historic and cultural values

Eligibility Determination:

Segment B of Passage Creek is eligible for designation under the National Wild and Scenic Rivers Act. It is free-flowing and has outstandingly remarkable historic and cultural values.

Classification Determination:

Because Segment B of Passage Creek is eligible for designation, it is necessary to determine the classification that could result from designation. According to the criteria in FSH 1909, Chapter 8, the entire 21.3 miles qualifies for inclusion in the system under the recreational classification. This determination results from the relatively large number of houses and farms located along the river.

Segment C - From Forest Boundary downstream to North Fork Shenandoah

This 6.9-mile segment flows through a narrow gorge located in Shenandoah County. It is bordered by Forest lands for 4.3 miles and by private land for 2 6 miles. Adjacent National Forest System land is used primarily for recreation and timber production. State Route 678, a two-lane paved road, parallels the stream through the gorge. One small dam exists between Forest land and the state fish hatchery. Private land bordering the creek is typically used for agriculture. There are some houses and other developments in the corridor. Elizabeth Furnace Recreation Area is a relatively large developed recreation site located on the creek on Forest land. The state has a fish hatchery in the corridor outside the Forest boundary. Most of the private property is posted. The segment on the Forest is stocked with trout under the state's put-and-take program. The segment is suitable for fish and wildlife propagation, wading, and canoeing during periods of high water. Water quality is average.

Eligibility of Segment C by:

Scenic Value: Segment C of Passage Creek is an attractive creek located within a narrow gorge. The gorge area is scenic and bordered by cliffs and rock formations that enhance the visual resource. The creek is shallow with occasional pools. Part of the stream has a fairly steep gradient and during storm periods, usually in the spring, the current is fast. The stream is bordered by steep mountain slopes as it passes through the gorge, then through rolling terrain before flowing into the Shenandoah River. Forest cover along the creek includes mixed hardwood and pine with common understory species. A Class-A-Distinctive rating is assigned to the scenic values.

Recreational Value: Current recreation use of Segment C consists of trout fishing under the state's put-and-take program, wading, and swimming. During periods of high water, the section in the gorge is also used for canoeing and kayaking. The stream is not considered navigable. A small dam is located just outside the Forest boundary. Adjacent private lands are posted so public access is limited to the part of the creek that crosses the Forest. Elizabeth Furnace Recreation Area is located in the corridor of this segment and offers both camping and picnicking. A Class A-Distinctive rating is assigned to the recreational values.

Geologic Value: This segment contains some outstanding cliffs and rock formations in the gorge area. A Class A-Distinctive rating is assigned to the geologic values.

Fish and Wildlife Values: The section on National Forest System land is stocked with trout under the state's put-and-take program. The creek also supports smallmouth bass and sunfish populations. A state fish hatchery is located within the corridor just outside the Forest. The area provides habitat for wildlife species common to the Forest. A Class B-Common rating is assigned to the fish and wildlife values.

Historic and Cultural Values: This segment of Passage Creek and its corridor contain several potentially significant historical sites. Elizabeth Furnace, an old iron furnace, is located within the corridor. The Elizabeth Furnace recreation area was constructed by the CCC. An old log cabin from the charcoal iron furnace era, a slave cemetery, and prehistoric sites are also located within the corridor A Class A-Distinctive rating is assigned to the historic and cultural values.

Eligibility Determination:

Segment C of Passage Creek is eligible for designation under the National Wild and Scenic Rivers Act. With the exception of a small dam located between the state fish hatchery and national forest land, it is free-flowing. As is stated in FSH 1909, Chapter 8.21b, "...the existence of low dams...at the time any river is proposed for inclusion.. does not automatically disqualify it for designation...." Also, this segment of the creek has outstandingly remarkable scenic, recreational, geologic, historic, and cultural values.

Classification Determination:

Because Segment C of Passage Creek is eligible for designation, it is necessary to determine the classification that could result. According to the criteria in FSH 1909, Chapter 8, the entire 6 9 miles qualifies for inclusion in the system under the recreational classification. This classification is for several reasons, including the presence of the Elizabeth Furnace Recreation Area and a number of houses and farms along the creek.

ST. MARY'S RIVER

A total of 8.6 miles of St. Mary's River is considered in this evaluation. St. Mary's is divided into two segments for evaluation purposes. St. Mary's is described in this report from its headwaters west to its confluence with the South River. The first segment includes the headwaters down to where the river exits the St. Mary's Wilderness boundary. The second segment includes that portion from the St. Mary's Wilderness boundary to its confluence with the South River. National Forest System land along the upper reaches borders the St. Mary's on both sides for 4 60 miles and on one side for 0.50 miles. St. Mary's is a small stream with low rates of flow except during major storm events. The upper segment, all on the Forest, is currently designated as a State Scenic River. This section is also within the St. Mary's Wilderness.

The stream is not classified as navigable. The water quality is average for the Blue Ridge Mountains. There is some disturbance as a result of floods outside the Forest boundary. A road parallels most of the portion on private property and there are some private developments. There are no impoundments. This stream is suitable for normal fish and wildlife propagation. There is trout fishing and wading in the St. Mary's.

Segment A - From the headwaters to the St. Mary's Wilderness boundary (4.6 miles).

Eligibility of Segment A by:

Scenic Value: There are rock formations and small waterfalls within this segment of the St. Mary's River. The stream is designated as a State Scenic River. A Class B-Common rating is assigned to scenic values.

Recreational Value: Current recreation use consists of fishing for brook trout, wading, bathing, hiking, and camping. Recreation use along the river is high. In addition, this segment is located within St. Mary's Wilderness and, as such, offers a unique recreation opportunity not available on most of the Forest. The stream is not large enough to permit canoeing and there is no record of such use. There is an old mining railroad grade that has been developed into a trail along a portion of the stream . A Class A-Distinctive rating is assigned to recreational values.

Geologic Values· Within the wilderness area, there are rock outcrops and small waterfalls. The river also flows through a small gorge. While these features add to the geological value of the river, they are not uncommon in the Blue Ridge Mountain area. A Class B-Common rating is assigned to the geologic values.

Fish and Wildlife Values. This stream contains native brook trout and a few wild rainbow trout. Segment A of St Mary's River is a Featured Brook Trout Stream. Acid deposition has almost completely eliminated rainbow trout and brown trout. Several minnow species have been eliminated. If acid deposition continues to destroy the fishery, the value of the river from a fisheries standpoint will be reduced. The area provides habitat for wildlife species typical of the Forest. A Class A-Distinctive rating is assigned to the fish and wildlife values.

Historic and Cultural Values: An old mining railroad grade parallels the stream. There are known archeological sites in the corridor. There is evidence of iron ore washers in the stream channel. Since no systematic survey has been conducted in this corridor, a Class B - Common rating is assigned to the historic and cultural values.

Eligibility Determination·

Segment A of St. Mary's River is eligible because it is free-flowing and has outstandingly remarkable recreational and fish and wildlife values

Classification Determination:

Because St. Mary's River is eligible for designation, it is necessary to determine the classification that would result from designation. According to the criteria in FSH 1909, Chapter 8, the entire 4.6 miles qualifies for inclusion in the system under the wild classification. This determination is based primarily on the fact that little or no man-made disturbances exist within the river corridor inside St. Mary's Wilderness.

Segment B - From the St. Mary's Wilderness Area boundary to the confluence with the South River (4 miles).

Eligibility of Segment B by:

Scenic Value: No outstanding features are present The scenery is common for the area. There are some man-made intrusions along the stream. A Class B-Common rating is assigned to scenic values.

Recreational Value: Current recreation use consists of fishing for brook trout and some wading and bathing. The stream is not large enough to permit canoeing and there is no record of such use. A Class B-Common rating is assigned to recreational values.

Geologic Value: A Class B-Common rating is assigned to the geologic values.

Fish and Wildlife Values: This stream contains a few trout. The area provides habitat for wildlife species typical of the Forest. A Class C-Minimal rating is assigned to the fish and wildlife values.

Historic and Cultural Values: There are no known archeological sites in the corridor. However, since it is in the Blue Ridge Mountains, the potential for archeological sites is strong. A Class C-Minimal rating is assigned to the historic and cultural values.

Eligibility Determination:

Segment B of St. Mary's River is not eligible for designation under the National Wild and Scenic Rivers Act because of the lack of outstandingly remarkable values. For this reason, Segment B of St. Mary's River will not be studied further for designation.

NORTH FORK SHENANDOAH RIVER

The section of the North Fork of the Shenandoah River evaluated here consists of a 39-mile segment between State Highway 55 at Strasburg and State Route 675 at the town of Edinburg. The segment is located in Shenandoah and Frederick counties. Of note, the segment of the North Fork Shenandoah River from Burnshire Bridge to the Route 55 crossing in Strasburg, Virginia, qualifies for inclusion in the state's scenic river system. Forest property borders the east side of the river at three locations for a total of 0.6

miles. Each of these sites consists of steep bluffs and, as such, is not suitable for canoe access. Most of the river lies outside the Forest.

From a structural standpoint, there are two old power dams on the river and several low water bridges. Roads cross the river in four locations and additional roads end adjacent to the river. There is no developed trail access. The town of Woodstock obtains its water from the river. Water from the river is also used for irrigation of corn west of Edinburg. The stream is shallow between pools. Overall, the river follows a gradual gradient and the flow is fairly slow with uniform flow characteristics. Development along the shoreline includes farm land, subdivisions, and vacation cabins. Forest management practices are also evident at certain points along the river. The river is suitable for fish and wildlife propagation, wading, canoeing, and other uses. Water quality is average. The segment is considered navigable. The state has marked the segment from New Market to Riverton for further study.

Eligibility of the 39-mile Segment by:

Scenic Value: The evaluation segment includes the "Seven Bends" of the Shenandoah River, an interesting and scenic area where the river makes a series of sharp bends, at times almost turning back on itself. The surrounding valley is gently rolling with the Massanutten Ridge rising steeply on the east side. There are several shale bluffs evident from the river. The adjacent forest cover is typical mixed hardwood and pine with common understory species. A Class A-Distinctive rating is assigned to the scenic values.

Recreational Value: Current recreation use is limited due to the lack of public access. There is fishing, canoeing and swimming, mostly by adjacent landowners and guests. The river is considered to be navigable. A Class B-Common rating is assigned to the recreational values.

Geologic Value: This segment contains the "Seven Bends," a significant physiographic/ geographic feature. A few shale bluffs are located along the river. A Class A-Distinctive rating is assigned to the geologic values.

Fish and Wildlife Values: This segment supports a sport fishery of smallmouth bass, sunfish, and catfish. The smallmouth bass fishing is not as well known or as good as in other rivers in the state. The area provides habitat for wildlife species typical of the Forest. A Class B-Common rating is assigned to the fish and wildlife values.

Historic and Cultural Values: There are known prehistoric sites along the river. Historic sites are plentiful as the river meanders through the historic Shenandoah Valley. There are several old houses within the corridor. A Class A-Distinctive rating is assigned to the historic and cultural values.

Eligibility Determination:

This 39-mile section of the North Fork of the Shenandoah River is eligible for designation under the National Wild and Scenic Rivers Act. It is free-flowing and has outstandingly remarkable scenic, geologic, historic, and cultural values.

Classification Determination:

Because the North Fork Shenandoah River is eligible for designation, it is necessary to determine the classification that could result from designation. According to the criteria in FSH 1909, Chapter 8, the entire 39 miles qualifies for inclusion in the system under the recreational classification. This determination is based on the large number of houses and other developments located within the corridor.

SOUTH FORK SHENANDOAH RIVER

This evaluation covers 36 miles of the South Fork of the Shenandoah River. Because the river and the surrounding corridor are so physically similar, the entire 36 miles will be studied as one segment. The segment begins at the Bixler Bridge located on Virginia secondary road 675, approximately 3 miles northwest of Luray. It ends at Karo Landing, approximately 6 miles south of the town of Front Royal. The evaluation segment is located within Page and Warren counties and is considered navigable. Forest property borders the west side of the river for 9.5 miles and borders both sides for 0.4 miles. Two low water bridges cross this segment. The area under consideration has good public access. Land uses along the river include agriculture, summer homes, and year-round residences. Evidence of human activity is abundant and increasing.

The river is suitable for fish and wildlife propagation, wading, canoeing, and other uses. Water quality is average. Portions of roads parallel the river and are evident from the river. A railroad is evident from the river in two locations. Page Power Company, now Potomac Edison, acquired flowage easements for a proposed dam at Overall in 1930. These easements are still in effect even though the dam has never been constructed. The state has recognized the segment of the South Fork from Goods Mill to Overall for inclusion in the Virginia Scenic Rivers System.

Eligibility of a 36-mile Segment by:

Scenic Value: The South Fork of Shenandoah River is typical of the larger rivers in and around the Forest. It is an attractive river. A couple of cliffs along the river add to the scenery. The river meanders over a gradual gradient from pool to pool. There are a few locations where the gradient increases and the flow becomes faster. The surrounding valley is gently rolling with mountains in the background. Forest cover consists of mixed hardwoods and pine with common understory species. There are numerous summer camps along the river. All in all, there are no features that rate as distinctive or outstanding. A Class B-Common rating is assigned to the scenic values.

Recreational Value: Current recreation use consists of fishing, canoeing, tubing, swimming, and hunting. There are canoe rental businesses at Bealers Ferry and Bentonville. There are also two canoe camps and a family campground at Hazard Mill that are accessible from the river. Several canoe launch sites are available to the public and canoe use is high. The river is considered navigable. A Class A-Distinctive rating is assigned to the recreational values.

Geologic Value: This river and its corridor contain no unusual rock outcroppings or other geological formations There are a couple of small cliffs and several ledges that cross the channel. A Class B- Common rating is assigned to the geologic values.

Fish and Wildlife Values: This river supports a top quality smallmouth bass population. Catfish and sunfish are also important species in the Shenandoah River. The area provides habitat for wildlife species typical of the Forest. A Class A-Distinctive rating is assigned to the fish and wildlife values.

Historic and Cultural Values: There are several known archeological sites within the corridor. The area was settled in the 1700s and there are several old houses along the river. Additionally, the river was used to carry pig iron and farm products before the coming of the railroads. An Indian fish weir can still be seen at one location on the river. A Class A-Distinctive rating is assigned to the historic and cultural values.

Eligibility Determination·

The South Fork of the Shenandoah River is eligible for designation under the National Wild and Scenic Rivers Act. It is free-flowing and has outstandingly remarkable recreation, fish and wildlife, and historic and cultural values.

Classification Determination:

Because the South Fork of the Shenandoah River is eligible for designation, it is necessary to determine the classification that could result from designation. According to the criteria in FSH 1909, Chapter 8, the entire 36 miles qualifies for inclusion in the system under the recreational classification. This potential classification is based on the large number of houses and other developments located within the corridor.

TYE RIVER

The Tye River is described in this evaluation from the town of Nash to its headwaters. Two segments of the Tye River, totaling 13 miles, are reviewed in this evaluation. These segments include those portions of the Tye River and the South Fork of the Tye River that are west of and within the George Washington National Forest boundary. East and south of the boundary, the Tye River was heavily disturbed by the floods of 1969, 1972, and 1985. Forest land ownership along this 13-mile segment of the river includes 1.00 mile on both sides of the stream (3 locations) and 0.2 miles on one side (4 locations). The river is not

classified as navigable. The state did not find this stream worthy of inclusion in the Virginia Scenic River System.

Segment A - From Nash to Proclamation Boundary (8.3 miles)

This 8.3-mile segment is located within Nelson County. The majority of land bordering this segment is privately owned. Forest land borders both sides of the stream in two locations for approximately 0.5 miles The river is medium in size and except during storm periods, the rate of flow is slow. There are no impoundments along this section. State Highway 56 parallels and is visible along the entire segment from Nash to the boundary. The Appalachian Trail crosses the stream via a swinging foot bridge. There are several houses located within the corridor along this section The stream and surrounding floodplain were heavily damaged during the floods of 1969, 1972, and 1985. Channelization of the river is prevalent along this segment. Lands bordering the river include a mixture of undeveloped forest and agricultural land. Some of the adjacent private land is posted. A section of this segment is stocked with trout under the state's put-and-take program.

Eligibility of Segment A by

Scenic Value: Segment A of the Tye River is typical of many rivers on the George Washington National Forest. It is an attractive river but has no distinctive or outstanding features. The stream is shallow with some small pools. For the most part, it has a gradual gradient so the rate of flow is fairly slow and uniform except during storm periods. Steep mountains rise above the river on both sides. No rock bluffs are evident. The forest cover is typical mixed hardwood and pine with common understory species. This segment has been heavily channelized. State Highway 56 is adjacent to this segment and several houses exist within the river corridor. A Class B-Common rating is assigned to the scenic values.

Recreational Value: Current recreation use of Segment A consists of fishing (put-and-take) and some canoeing and kayak use during early spring. There is also some swimming by adjacent landowners. This segment is not considered navigable. Public access for recreation purposes is limited. The Appalachian Trail crosses this segment by means of a swinging foot bridge. A Class B-Common rating is assigned to the recreational values.

Geologic Value: This segment contains no unusual geological formations. The corridor consists of farm land and forest typical of the George Washington National Forest. A Class C-Minimal rating is assigned to the geologic values.

Fish and Wildlife Values: A large portion of this segment is stocked with trout under the state's put-and-take system. The segment provides habitat for wildlife species typical of the Forest. A Class B-Common Rating is assigned to the fish and wildlife values.

Historic and Cultural Values: There are known prehistoric and historic sites along this segment. Since no systematic survey has been conducted along this section to determine their significance, a Class B-Common rating is assigned to the historic and cultural values.

Eligibility Determination:

Segment A of the Tye River is not eligible for designation under the National Wild and Scenic Rivers Act. It has been channelized in many locations and does not have any outstandingly remarkable scenic, recreational, geologic, fish and wildlife or historic and cultural values. For these reasons, Segment A will not be studied further for designation under the National Wild and Scenic Rivers Act.

Segment B - From headwaters to Nash (4.7 miles)

This 4.7-mile segment is located within Nelson County. The majority of lands bordering this segment of the river are privately owned. Forest property touches this segment at several locations and totals approximately 0.70 miles. This segment of the river ranges in size from small to medium. The steep gradient along this segment results in small rapids, drop-offs, and cascades. Portions of the segment are paralleled by State Highway 56. The Crabtree Falls developed recreation site is located within the corridor where Crabtree Creek enters the river. The site consists of paved parking facilities, restrooms, and an observation trail to the top of Crabtree Falls.

While the majority of the shoreline is privately owned, the shoreline remains mostly undeveloped. With few exceptions, the adjacent private property is posted. Forestry and agricultural practices occur and are evident within the river corridor. The segment is suitable for fish and wildlife propagation, canoeing, and other water-based recreation uses. Water quality is average.

Eligibility of Segment B by:

Scenic Value: Segment B of the Tye River is attractive. This segment is characterized by swift water, rapids, and cascades. The river bed is littered with large boulders that add variety to the visual resource. The upper portion of this segment flows through a gorge that contains waterfalls. The stream valley is relatively narrow and is bordered on both sides by steep mountains. Forest cover along the river consists of mixed hardwoods and pine and common understory species. A Class A-Distinctive rating is assigned to the scenic values.

Recreational Value: Current water based recreation use consists of fishing and white water canoeing when water levels are sufficient. There is an established wild trout population within this segment. Many people hike this segment to view the scenery. A Class A-Distinctive rating is assigned to the recreational values.

Geologic Value: The gorge area has some outstanding rock outcroppings. Scattered along the streambed are numerous boulders and rocks. A Class A-Distinctive rating is assigned to the geologic values.

Fish and Wildlife Values: This segment supports a wild trout fishery. The area provides habitat for wildlife species typical of the Forest. A Class B-Common rating is assigned to the fish and wildlife values.

Historic and Cultural Values: There are known archeological sites within this segment, including at least one potentially significant prehistoric site. A Class A-Distinctive rating is assigned to the historic and cultural values.

Eligibility Determination:

Segment B of the Tye River is eligible for designation under the National Wild and Scenic Rivers Act. It is free-flowing and has outstandingly remarkable scenic, recreational, geologic, and historic and cultural values.

Classification Determination:

Because Segment B of the Tye River is eligible for designation, it is necessary to determine the classification that could result from designation. According to the criteria in FSH 1909, Chapter 8, the entire 4.7 miles qualifies for inclusion in the system under the scenic classification.

TABLE D-1. SUMMARY OF RIVER ELIGIBILITY DETERMINATIONS

RIVER	COUNTY AND STATE	LENGTH (Miles)	ELIGIBLE	POTENTIAL CLASSIFICATION
BACK CREEK				
Segment A	Bath, VA	5.59	YES	Scenic
Segment B	Bath, VA	9 96	YES	Recreational
Segment C	Highland, VA	17 24	NO	Recreational
BULLPASTURE RIVER				
Segment A	Bath/High, VA	3 00	YES	Scenic
Segment B	Highland, VA	15.00	NO	
CEDAR CREEK	Shen/Fred, VA	25.00	YES	Scenic
COWPASTURE RIVER				
Segment A	Alleghany, VA	16.00	YES	Recreational
Segment B	Bath, VA	48.11	YES	Recreational
Segment C	Bath/High, VA	6.00	NO	
Segment D	Highland, VA	8 00	NO	
DRY RIVER	Rockingham, VA	22 00	NO	
IRISH CREEK	Rockbridge, VA	8 50	NO	
JACKSON RIVER				
Segment A	Bath/High, VA	14 30	NO	
Segment B	Bath, VA	7.06	YES	Scenic
Segment C	Bath, VA	8 33	YES	Scenic
Segment D	Alleghany, VA	13 00	YES	Recreational
NORTH RIVER				
Segment A	Augusta, VA	9 00	NO	
Segment B	Augusta, VA	5 00	YES	Scenic
Segment C	Augusta, VA	2 00	NO	
PASSAGE CREEK				
Segment A	Shenandoah, VA	6.30	NO	
Segment B	Shenandoah, VA	21 30	YES	Recreational
Segment C	Shenandoah, VA	6 90	YES	Recreational
ST. MARY'S RIVER				
Segment A	Augusta, VA	4 60	YES	Wild
Segment B	Augusta, VA	4.00	NO	
NORTH FORK SHENANDOAH	Shen/Fred, VA	39.00	YES	Recreational
SOUTH FORK SHENANDOAH	Page/Warren VA	36 00	YES	Recreational
TYE RIVER				
Segment A	Nelson, VA	8 30	NO	
Segment B	Nelson, VA	4 70	YES	Scenic

TABLE D-2. NATIONAL FOREST OWNERSHIP BY RIVER

RIVER	LENGTH (Miles)	ONE BANK (Miles)	BOTH BANKS (Miles)
BACK CREEK			
Segment A	5 59	0 01	2 35
Segment B	9 96	1 51	0.00
Segment C	17 24	0 00	0 00
BULLPASTURE RIVER	18 00	0 00	0 00
CEDAR CREEK	25 00	0 10	2 65
COWPASTURE RIVER			
Segment A	16 00	3.00	0.00
Segment B	48.11	4 33	4 28
Segment C	6 00	0 00	0 00
Segment D	8.00	0 00	0 00
DRY RIVER	22 00	0 00	0 00
IRISH CREEK	8 50	0 00	5 50
JACKSON RIVER			
Segment A	14 30	0 66	0 00
Segment B	7 06	0 42	6 62
Segment C	8 33	0 27	0 00
Segment D	13.00	0 25	0 00
NORTH RIVER		0 00	14 50
Segment A	9 00	To be determined	To be determined
Segment B	5 00	To be determined	To be determined
Segment C	2 00	To be determined	To be determined
PASSAGE CREEK			
Segment A	6 30	0 90	5 40
Segment B	21 30	0 00	0 00
Segment C	6 90	0 00	4 30
ST MARY'S RIVER			
Segment A	4 60	To be determined	To be determined
Segment B	4 00	To be determined	To be determined
NORTH FORK SHENANDOAH	39 00	0 60	0 00
SOUTH FORK SHENANDOAH	36 00	9 50	0 40
TYE RIVER			
Segment A	8 30	0 00	0 50
Segment B	4 70	0 20	0 50

TABLE D-3. LEAD AGENCY IN CONDUCTING SUITABILITY STUDIES

AGENCY	RIVER SEGMENT
Virginia Department of Conservation and Recreation	Bullpasture River - Segment A Cedar Creek Cowpasture River - Segments A and B Jackson River - Segments C and D Passage Creek - Segment B South Fork Shenandoah North Fork Shenandoah Tye River - Segment B
USDA Forest Service	Jackson River - Segment B North River - Segment B St. Mary's River
USDA Forest Service/Virginia Department of Conservation and Recreation joint study	Back Creek - Segments A and B Passage Creek - Segment C

III. THE PROCESS: HOW RIVERS ARE EVALUATED FOR WILD AND SCENIC DESIGNATION

The National Wild and Scenic River designation process is a three-step process. The first step is the eligibility study. If a river is determined to be eligible, step two determines the potential classification of the river. The three potential classifications are wild, scenic, or recreational. Upon completion of steps one and two, step three assesses the suitability of the river for inclusion in the national system. The criteria associated with each step are discussed on the following pages.

Eligibility Criteria:

The Wild and Scenic Rivers Act sets no specific requirements concerning the length of a river segment being considered, but states that a river segment is of sufficient length if, when managed as a wild, scenic, or recreational river area, the "outstandingly remarkable" values are protected.

The determination of whether a river or river segment contains outstandingly remarkable values is, for the most part, a judgement based on the qualities of a river relative to qualities of other rivers in the Forest and on adjoining private and state lands.

Rivers eligible for wild and scenic designation must be free-flowing and possess, with their adjoining land, one or more outstandingly remarkable values. The value categories are SCENIC, RECREATIONAL, GEOLOGIC, FISH AND WILDLIFE, HISTORIC, CULTURAL.

Within each value category, rivers are rated as either:

CLASS A - DISTINCTIVE with outstanding qualities when compared to other rivers;
CLASS B - COMMON with qualities common to most rivers;
CLASS C - MINIMAL with few or no outstanding qualities.

Scenic Values, for instance, that are rated:

Class A-Distinctive indicate complex landforms with unusual or outstanding topographic features. Rock features, when present, stand out on the landform and are unusual or outstanding in size, color, or location. Forest cover is continuous or if broken, has a high degree of vegetative patterns and an unusual or outstanding diversity in plant species. Large or old-growth timber may be present. The stream volume ranges from medium to high with a variety of flow characteristics.

Class B-Common indicate some variety in the terrain, but landform features typical of the area. Rock features, when present, are obvious, but do not stand out and have no unusual characteristics Forest cover is continuous with some variety in vegetative patterns and a common diversity in plant species. The stream volume ranges from medium to low with some variety in flow characteristics.

Class C-Minimal indicate terrain with little variety in slope, dissection, or features. Rock features are generally lacking. Forest cover is continuous with little diversity in the number or pattern of plant species The stream typically has little or no variety in flow characteristics.

Recreational Values that are rated.

Class A-Distinctive indicate rivers and surrounding lands that provide both water-based and land-based activities and recreation experiences unique to a stream or to a limited number of streams, or which can occur only because of the character of the stream. The river might contain a high quality sport fishery.

Class B-Common indicate rivers and surrounding lands that provide water-oriented activities typical of most streams in the area Activities include fishing, swimming, boating (motorized and non-motorized), and waterfowl hunting.

Class C-Minimal indicate stream size, flow or other characteristics that limit opportunities for water-based and land-based recreation

Geological Values that are rated:

Class A-Distinctive indicate river corridors that clearly display significant or unusual geologic features Also included are rivers that clearly expose geologic formations which are visible in few other sites. The amount of exposed rock is significant in that it provides excellent opportunities for geologic study.

Class B-Common indicate geomorphic features and formations that are typical of those commonly found in the area. There is some opportunities for geologic study.

Class C-Minimal indicate rivers with few or no exposed rock formations and no significant geologic features.

Fish and Wildlife Values that are rated·

Class A-Distinctive indicate resident fish and wildlife populations that occur only because of the character of the stream. This category includes streams identified as habitat for federally-listed threatened and endangered species.

Class B-Common indicate resident fish and wildlife populations that are common to the area.

Class C-Minimal indicate stream characteristics that limit the number and type of fish and wildlife species present. Included here are streams stocked by the states on a put-and-take basis.

Historical and Cultural Values that are rated:

Class A-Distinctive indicate river corridors that contain known sites of local, state, or national significance and meet criteria for the National Register of Historic Places.

Class B-Common indicate sites that are similar to sites in other locations and that contain limited scientific information. Some sites may have been disturbed prior to scientific investigation. Also included are known sites that have not been evaluated.

Class C-Minimal indicate sites that are not of local, state, or national significance and do not meet criteria for the National Register of Historic Places.

Classification Criteria:

The Act (Section 2(b)) states that "if included (in the National Wild and Scenic Rivers System, each river) shall be classified, designated, and administered" as either a WILD, a SCENIC, or a RECREATIONAL river area. The classification selected is based on the conditions of the river and the adjacent land at the time of the evaluation. A river may be divided into segments by these classifications, based on current conditions.

The criteria to be met under each classification are: WATER RESOURCES DEVELOPMENT, SHORELINE DEVELOPMENT, ACCESSIBILITY, AND WATER QUALITY. These criteria are from the revised guidelines for Wild and Scenic Rivers developed jointly by the departments of Interior and Agriculture (Federal Register, Vol. 47, No. 173, September 7, 1982).

Classification as a WILD River requires under:

Water Resources Development -- a river that is free of impoundments.

Shoreline Development -- a shoreline that is essentially primitive with little or no evidence of human activity. However, the presence of a few inconspicuous structures is acceptable. There is to be little or no evidence of past timber harvests and no ongoing timber harvests.

Accessibility -- a river area that is generally inaccessible except by trail. There are to be no roads, railroads, or other provisions for vehicular travel However, a few existing roads leading to the boundary of the river corridor are acceptable.

Water Quality -- a river that meets or exceeds federally-approved state standards for aesthetics, propagation of fish and wildlife normally adapted to the river, and primary contact recreation.

Classification as a SCENIC River requires under.

Water Resources Development -- a river that is free of impoundments.

Shoreline Development -- a shoreline that is largely primitive and undeveloped with no substantial evidence of human activity. However, the presence of small communities, dispersed dwellings or farm structures is acceptable. Evidence of past or ongoing timber harvests is acceptable if the Forest appears natural from the riverbank.

Accessibility -- a river area that may be accessible in places by roads. Roads may occasionally reach or bridge the river. The existence of short stretches of conspicuous or longer stretches of inconspicuous roads or railroads is acceptable.

Water Quality -- no criteria for water quality is prescribed in the Act. Poor water quality does not preclude classification provided a water quality improvement plan exists or is being developed.

Classification as a RECREATIONAL River requires under:

Water Resources Development -- a river that may have some existing impoundments or diversions The existence of low dams, diversions, or other modifications is acceptable if the waterway remains generally natural and riverine in appearance.

Shoreline Development -- a shoreline that may have some development with substantial evidence of human activity. The presence of extensive residential developments and a few commercial structures is acceptable. Lands may have been developed for a full range of agricultural or forestry uses and may show evidence of past or ongoing timber harvests.

Accessibility -- a river area readily accessible by roads or railroads. Parallel roads or railroads on one or both banks and bridge crossings are acceptable.

Water Quality -- no criteria for water quality is prescribed in the Act. Poor water quality does not preclude classification provided a water quality improvement plan exists or is being developed.

Suitability Criteria:

Determinations of suitability for inclusion in the National Wild and Scenic Rivers System are made by state agencies, the Forest Service, and other federal agencies. Criteria that determine suitability include the following:

-the current status of land ownership and use in the area,

-the reasonably foreseeable uses of the land and water that would be enhanced, foreclosed, or curtailed if the area were included in the National Wild and Scenic Rivers System;

-the estimated cost of acquisition of land or of an interest in the land if the river area cannot be administered as a wild and scenic river without acquisition or easement as a means of control;

-the public, state, and local government interest in and potential involvement in management and administration,

-the amount and status of outstanding minerals;

-other issues and concerns that surface during scoping for public input.

Protection Under the Forest Plan:

The segments of rivers within Forest Service boundaries that are determined eligible for designation are managed in a manner that protects the values that made them eligible. The land adjacent to the river segments is afforded the same protection. The protection lasts until a final suitability determination is made by the responsible agency. Direction for management is in the standards for the Wild and Scenic River Management Prescription.

Management prescriptions and other Forest Plan Revision process records are available for review in the Supervisor's Office, 101 North Main Street, Harrisonburg, Virginia 22801.

APPENDIX E
MINERALS

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I. LEGAL AND POLICY CONSIDERATIONS

Following are the primary laws, regulations, and policies which regulate minerals activities on the George Washington National Forest (GWNF or GW).

The Federal Onshore Oil and Gas Leasing Reform Act of 1987 (PL 100-203) provides for the competitive leasing of lands through oral bidding, $2.00 per acre minimum acceptable bids, quarterly lease sales, public notice of lease sales 45 days prior to auction and requirement that the Secretary of Agriculture consent to national forest lands offered for lease auction.

The National Materials and Minerals Policy Research and Development Act of 1980 (94 Stat. 2305; 30 USC 1601-1605) states the current policy of the Federal government regarding mineral resource exploration and development. This Act states that private enterprise is to be encouraged to develop domestic mineral resources and that Federal agencies are to facilitate availability and development of domestic resources. It also emphasizes prompt reclamation of disturbed lands.

The Energy Security Act of 1980, Section 262 (42 USC 8855) directs the Forest Service to proceed in making recommendations to the BLM regarding leasing proposals on national forest Systems lands. Applications for geophysical survey permits must also be processed promptly. The Forest Service may not wait for the Forest Land and Resource Management Plans to be completed before acting upon applications for oil and gas leases.

The Clean Air Act (91 State. 685; 42 USC 7401 et seq), provides that each state is responsible for ensuring the achievement and maintenance of air quality standards within its borders.

The Federal Water Pollution Control Act, as amended by the Clean Water Act in 1977 (33 USC 1251 et. seq.) establishes national standards to restore and maintain the chemical, physical, and biological integrity of the Nation's waters.

The Endangered Species Act of 1973 (Public Law 93-205, 16 USC 1531, et. seq.) as amended, requires special protection and management for threatened and endangered species on Federal lands. The Fish and Wildlife Service (FWS), U S Department of the Interior, is responsible for the administration of this Act. Federal agencies proposing an action or processing an action by a third party which "may affect" the existence of identified species must consult with FWS to determine if the proposed action will jeopardize the continued existence of those species.

The Wilderness Act of 1964 78 Stat. 890; 16 USC (1131-1136) establishes a National Wilderness Preservation System (NWPS) made up of lands administered by the Forest Service (Department of Agriculture) and the Department of the Interior. Section 2 (a) of the Act states that wilderness areas.. shall be administered for the use and enjoyment of the American people in such manner as will leave them unimpaired for future use and enjoyment as wilderness..." The Act provides for non-surface disturbing exploration activities in wildernesses.

The Wild and Scenic Rivers Act of October 2, 1968 82 Stat 906, as amended; 16 USC (1271-1287) declares it to be the "policy of the United States that certain selected rivers of the Nation...shall be preserved in free-flowing condition, and that they and their immediate environments shall be protected for the benefit and enjoyment of present and future generations." In August of 1979, President Jimmy Carter issued a directive requiring each Federal Agency to "...take care to avoid or mitigate adverse effects on rivers identified in the Nationwide Inventory of Potential Wild and Scenic Rivers."

The Mineral Leasing Act for Acquired Lands of August 7, 1947, as amended (30 U.S.C. 351-359), authorizes the Department of Interior to lease certain minerals on acquired federal lands pursuant to the same terms and provisions of the Mineral Lands Leasing Act of 1920 and its amendments. These minerals include deposits of coal, oil, gas, phosphate, sodium, and others.

The Organic Act of 1897 (16 USC 475), which provided for the administration of national forests, and the Multiple Use-Sustained Yield Act of 1960 (16 USC 528) establishes the legal mandate that the national forests are to be administered for outdoor recreation, range, timber, watershed, and wildlife and fish purposes. The Multiple Use-Sustained Yield Act further states that management of national forest System lands shall not affect the use or administration of mineral resources in these lands.

The Materials Act of 1947 (61 Stat 681), authorizes disposal of materials including but not limited to stone, sand, gravel, and common clay on public land through a sales system. The law also provides for free use of these materials by government agencies, municipalities, and non-profit organizations.

The Geothermal Steam Act of 1970 (84 Stat 1566), authorized the leasing of geothermal resources on public lands.

Federal Cave Resources Protection Act of 1988 (16 USC 4300-4309; 102 Stat 4546), provides for the management of significant cave resources including mineralogical, geological, and paleontological values.

Forest Service Minerals Program Policy, sets forth FS policy for management of mineral and energy resources on national forest system lands.

Bureau of Land Management, Mineral Resource Policy, sets forth BLM policy for the management of mineral and energy resources on public lands

II. MINERALS AND GEOLOGY OF THE GW

All of the George Washington National Forest, with the exception of the Pedlar Ranger District, lies within the Valley and Ridge physiographic province of Virginia and West Virginia. The Valley and Ridge province consists of Paleozoic sedimentary rocks forming long, narrow mountain belts and parallel valleys with a general northeast-southwest trend. The ridges are composed of quartzite and sandstones, the valleys are chiefly shales and carbonates. Karst topography is associated with some limestones in the valleys. The Forest is located mostly on the slopes and ridges, with shales, sandstones, and quartzites as the predominant rock types. The character of the parallel ridges and valleys is directly influenced by the overall geologic structure of the region. Anticlines and synclines (n-shaped and u-shaped folds) trending parallel with the ridges and valleys are common throughout the Forest. The Warm Springs anticline is a good example of these features. Stream drainage patterns are of the "trellis" or parallel type and follow the geology and geomorphology of the region.

The Pedlar District is within the Blue Ridge physiographic province. The Blue Ridge Province is characterized by rugged mountains that rise abruptly above the Valley and Ridge province to the west and the Piedmont province to the east. The Blue Ridge is the central, older, "core" of the Appalachian Mountain chain This province has undergone a complex geologic history including folding and metamorphism. The core rocks are principally Precambrian-aged granites, gneisses, and meta-volcanics, which are overlain by Cambrian meta-sedimentary and sedimentary rocks. Radial drainage patterns more characteristic of igneous rock terrain is common in the Blue Ridge.

The consensus of geologists who have studied the tectonics of the Appalachian Mountains agree that this part of Virginia was created by major folding and thrust faulting. The Eastern Overthrust belt theory which incorporates thin-skinned tectonic processes is supported by seismic and geologic data. The data indicates that crystalline rocks of the Blue Ridge and highly deformed rocks of the Valley and Ridge province overlie formerly underformed Paleozoic sedimentary rocks in the Appalachians. Many millions of years ago, great masses of rocks were pushed from the east toward the west causing the buckling and breaking of the rocks in the Forest area. Since the end of the mountain-building process at the end of the Paleozoic era, erosion of the land surface has been the dominant geologic process. Harder rock units such as sandstone and granite are left forming the higher mountains. More easily eroded shales and limestones underlie the lowlands. Colluvium, derived from the breakdown and downward transport of blocks of sandstones and quartzites higher on the ridges, covers many lower slopes in the Forest. Slopes along Massanutten Mountain on the Lee RD provide an excellent example of this erosional process.

Geological features present within the Forest area include: caves in limestones, gorges with fast-running water, towering cliffs of sandstone providing vistas for the public, and thermal (mineral) springs The Warm Springs - Hot Springs area of the Forest is an important tourist attraction due to its large number of thermal springs.

III. STANDARD OPERATING PROCEDURES FOR LEASE AND DEVELOPMENT

Process for Leasing Oil and Gas Mineral Rights

This section presents a description of the oil and gas leasing and development program relative to the George Washington National Forest. It is included to provide the reader a better understanding of some of the standard methods and practices used to protect the environment during leasing and development phases. The contents should be viewed as a general overview and not as a detailed statement of the standards and procedures Such details are appropriately contained in various orders and regulations.

Oil and gas rights on acquired lands are subject to leasing and development under the Mineral Leasing Act for Acquired Lands of August 7, 1947, as amended (30 U S.C. 351-359).

The Federal Onshore Oil and Gas Leasing Reform Act of 1987 requires that all federal oil and gas leases be subject to competitive bidding In the eastern United States, sales are held quarterly by the Bureau of Land Management (BLM), Eastern States Office (ESO), and will include eligible lands based on interest expressed by industry and the public. The leasing procedure begins with the BLM receiving expressions of interest for specified lands. They send these to the Forest Service Regional Office along with a listing of expired/terminated leases and ask for consent to lease on the nominated tracts The Forest Service may also recommend lands for inclusion in the sale The Regional Office forwards this listing to the George Washington National Forest for their recommendation on the consent to lease decision and for any special lease development stipulations

Lease Terms Federal oil and gas leases include standard lease terms, many of which are designed to protect surface resources. The standard terms are on the back of the lease form. Such terms include the following requirements pertaining to environmental protection.

> Sec. 6. Conduct of operations - Lessee shall conduct operations in a manner that minimizes adverse impacts to the land, air, and water, to cultural, biological, visual, and other resources, and to accomplish the intent of this section. To the extent consistent with lease rights granted, such measures may include, but are not limited to, modification to siting or design of facilities, timing of operations, and specification of interim and final reclamation measures. Lessor reserves the right to continue existing uses and to authorize future uses upon or in the leased lands , including the approval of easements or rights-of-ways Such uses shall be conditioned so as to prevent unnecessary or unreasonable interference with rights of leasee
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> Prior to disturbing the surface of the leased lands, lessee shall contact lessor to be appraised of procedures to be followed and modifications or reclamation measures that may be necessary. Areas to be disturbed may require inventories or special studies to determine the extent of impacts to other resources Lessee may be required to complete minor inventories or short term special studies under guidelines provided by lessor If in the conduct of operations, threatened or endangered species, objects of historic or scientific interest, or substantial unanticipated environmental effects are observed, lessee shall immediately contact lessor. Lessee shall cease any operations that would result in the destruction of such species or objects
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> Sec. 7 Mining operations - To the extent that impacts from mining operations would be substantially different or greater than those associated with normal drilling operations, lessor reserves the right to deny approval of such operations.

Sec. 9. Damage to property - Lessee shall pay lessor for damage to lessor's improvements, and shall save and hold lessor harmless from all claims for damage or harm to persons or property as a result of lease operations.

Sec. 12. Delivery of premises - At such time as all or portions of this lease are returned to lessor, lessee shall place affected wells in condition for suspension or abandonment, reclaim the land as specified by lessor and within a reasonable period of time, remove equipment and improvements not deemed necessary by lessor for preservation of producible wells.

Stipulations. The Forest reviews the direction in the Plan for a specific lease proposal and determines if that area is available for leasing and what, if any specific stipulations need to be added to the lease application. Stipulations include No Surface Occupancy, Timing Limitation, or Controlled Surface Use Stipulations (see exhibits). The Forest then gives the Regional Office consent on those lands open for leasing and provides any stipulations to be attached to the lease. (If a decision on lease consent and stipulations has not been made in the Plan for that area, the Forest will determine the need for an additional *environmental analysis.) The consent and the stipulations are sent to the BLM and are collated and* published for the upcoming sale Forty-five days before the lease auction, a notice of the sale is posted in the Forest Supervisor's Office and at the BLM. At the sale, each lease tract is offered in an auction with oral bidding. The minimum bid is $2.00/acre Those parcels not receiving the minimum bid will be offered non-competitively (over-the-counter) beginning the day after the auction and will be available for non-competitive leasing for a period of two years. The primary term of all leases is now ten years. Either type of lease can be extended beyond the primary term by active production of commercial quantities of oil or gas or by active drilling operations. Unitization of communitization agreements with adjacent productive leases can also create lease extensions without development of the lease surface

Lease Rights. Once a federal oil and gas lease is issued, the lessee has the right to develop the petroleum resource subject to the stipulations attached to the lease and a site specific environmental analysis However, merely because a lease has been issued does not mean it will be developed. With very few exceptions, all of the oil and gas leases issued so far on the Forest have terminated or expired with no development ever taking place. In 1982, for instance, federal oil and gas leases generated $726,000 for the federal treasury without any of the leases being developed. Later years have seen decreases in the dollars generated. In 1990, undeveloped leases generated $55,000.

A lessee has a right to use the leased lands as necessary to explore for, drill for, mine, extract, remove and dispose of all the leased resources in a leasehold. This is subject to stipulations attached to the lease, restrictions derived from specific, non-discretionary statutes, and such reasonable measures as may be required by the authorized officer to minimize adverse impacts to other resource values, land uses or users not addressed in the lease stipulations at the time operations are proposed. When measures not included in the lease terms are added to an operational permit, they are included as Conditions of Approval. Such conditions are considered consistent with the lease rights granted provided that they do not: require relocation of proposed operations by more than 656 feet (200 meters); require that the operations be sited off the leasehold; or prohibit new surface disturbing operations for a period in excess of 60 days in any lease year.

Waivers, Exceptions, or Modifications. A lessee may request a modification, waiver, or one time exception of a No Surface Occupancy Stipulation, or any other stipulation. The Forest Service may authorize the BLM to grant the change if: (1) the change is consistent with federal law and the Forest Plan, (2) management objectives which led to the stipulation can be met following the change, and (3) any environmental impact of the change is acceptable. Public notice must be given at least 30 days before the results of an environmental analysis (i e , EA or EIS) are approved. Exhibits 1-3 contain the special lease

stipulations that would be available for inclusion in proposed lease offers on the Forest. Applicable stipulations would be selected from this group and included in specific lease proposals as specified in the Forest Plan decisions. Each special stipulation states the specific condition under which stipulation waivers, exceptions, or modifications would be granted.

Geophysical Exploration -- Application. Should the lessee choose to exercise the development right, a first logical step might be to locate subsurface hydrocarbon traps and structures through the use of geophysical instruments. Seismic lines may be laid out in grid, parallel, or perpendicular arrays to the suspected target area. The operator must contact the Forest and give the location, timing, and geophysical method (shot-hole, vibroseis, etc.) to be used. The Forest will analyze the proposed action and include a list of operating stipulations to mitigate any surface impacts. No fee will be charged if the entire survey is restricted to the land leased to the operator. If part of the survey extends onto unleased land or lands leased to another party, then the Forest will charge a fee for those lands that are either unleased or leased to another party. (Lessees of federal oil and gas rights do not have exclusive rights for geophysical surveys). A bond may be required to insure compliance with the permit stipulations.

Geophysical Exploration. An oil and gas lease is not required for geophysical exploration to occur; it may take place prior to or subsequent to leasing. Exploration activities may occur across the same area many times and continue over a period of years. Generally, geophysical lines are run on widely-spaced intervals and are narrowed and concentrated in smaller geographic areas as the target area is better defined. A separate permit is issued by the Forest for each geophysical request, and includes specific mitigating measures for public safety warnings, wildlife concerns, sensitive areas, property protection (fences, wells, buried utility lines, etc.), and site reclamation.

One method of geophysical exploration, vibroseis, uses large trucks equipped with metal plates which are lowered from beneath each vehicle to the ground. With the entire weight of the truck resting on the plate, a hydraulic system vibrates the plate which transfers the energy into the ground to be picked up by seismic detectors (geophones) arrayed along the line of survey. An instrument truck equipped with a seismograph records the seismic information. From two to eight trucks are used in tandem. Unless the topography is relatively flat and open, the trucks are restricted to existing roads and trails. Little resource disturbance occurs with this type of geophysical exploration.

Another way to impart energy into the ground for the seismograph to record is by use of explosives. This can be accomplished by setting off charges in a hole or on the surface. Shot-point cluster surveys are the most commonly used method of explosive seismic surveys in this region. Shot-point cluster uses the technique of drilling shallow holes and shooting several small charges simultaneously instead of one large charge. The holes are drilled to depths of 10 feet or less. An explosive is placed in each hole and detonated. The resulting shock waves are recorded by geophones and passed on to the seismograph. Shot holes are drilled with a portable drill which causes insignificant environmental damage.

In difficult terrain, explosive methods may be done using helicopters to ferry people, materials, and instruments to the detonation points along the lines of survey. This eliminates surface impacts resulting from vehicles, but it adds to the noise factor.

General Description of Exploration Drilling. Issued oil and gas leases may be explored and developed, subject to lease stipulations, additional site specific environmental analysis and a plan conformance determination. On the George Washington National Forest, most wells must be drilled to depths of 3,000 - 10,000 feet or more to intersect the possible target horizons.

The first phase of the operation is construction of the access road. Transporting and setting up a drill rig capable of reaching these depths requires an access road sufficient to handle semi-trucks and trailers of

heavy equipment and a daily traffic of 20-30 vehicles. Existing or abandoned roads are upgraded and used as much as possible. Drainage must be provided for the entire road. Usually this is accomplished by use of drainage ditches and culverts.

The second phase is construction of the well pad and reserve pit. The well pad is needed to set up and operate the rig. In the planning area the total well site area normally occupies less than one acre. The dimensions and layout of a well site vary based on the depth of the well, the natural contour of the land, and the resource values involved. Normally surface soil material is removed from the construction site and stockpiled. This material is used later for reclamation. The area of the well pad that supports the drilling rig substructure must be level and capable of supporting the rig. Ideally, the rig should be located on cut material. The site is designed to drain properly with all fluids and rain runoff within the disturbed site channeled toward the reserve pit. Runoff water from off site areas is diverted away from the well site by ditches, waterbars, or terraces above and below the cut slopes.

Reserve pits are normally a part of a well site and are used for storage or disposal of water, drill mud, and cuttings. This pit should be located as much as possible in cut material On steep slopes, this may not be entirely possible. In such cases, at least 50 percent to the reserve pit should be constructed below original ground level to prevent failure of the pit dike. Fill dikes must be compacted and on the George Washington National Forest the reserve pit would be lined with a plastic liner to prevent seepage of the fluids into the soil zones.

Water for drilling is either hauled or piped to the rig from rivers, creeks, reservoirs, water wells or a well is drilled on the well pad. Drilling is accomplished by rotating a bit at the end of the drill string under pressure bearing a controlled portion of the drill string weight. The system is circulated with either bentonite mud or compressed air and biodegradable soap. As the bit cuts into the rock, the cuttings are pushed up the hole by compressed air (air drilling) or a mixture of water, clay, and chemical additives (mud drilling). In a mud system the mud is separated from the cuttings and recycled. When drilling with air the cuttings are blown into the reserve pit. Cuttings, mud, and waste drilling fluids are contained in the reserve pit. The hole is cased with steel pipe and cemented into place. Casing and cementing prevents caving of the hole, seals off other formations and protects ground water aquifers. When total depth of the well is reached one or more of the following completion operations must be conducted in most wells: (1) logging, which measures porosity, permeability, and saturation of the formation, (2) drill stem testing, which allows production through the stem for accurate production measures, (3) installing and perforating the production casing to allow production of the formation, and (4) formation stimulation, which is usually fluid fracture or acid dissolution of the formation to increase the flow capacity of the formation. If producible oil and gas is discovered, the well will be shut in until production facilities are installed. If producible amounts of oil and gas are not encountered, the well will be plugged and abandoned.

Once the rig is set up, drilling usually takes place on a 24-hour/day, seven days/week basis. In the planning area drilling is usually completed within two weeks.

Drilling Analysis and Decision Making. Onshore oil and gas operations on federal minerals are subject to federal regulations contained in Title 43 CFR Part 3160. These regulations are administered through the BLM. Under the Reform Act, the Forest Service is responsible for administration of oil and gas operations as it pertains to surface use on national forest lands. The requirements for approval of drilling operations are specifically contained in Onshore Oil and Gas Order No. 1 (43CFR 3164). Prior to the approval of any drilling activities on the lease, the operator must obtain a permit from BLM. The permitting process begins when the applicant submits either an Application for Permit to Drill (APD) or a Notice of Staking (NOS) to the BLM, Jackson District Office (JDO). These are optional processing methods available under Order No. 1. Notice of an APD or NOS must be posted in the affected Forest Service and BLM offices at least 30 days prior to approval. Upon receipt of either an APD or a NOS an on-site inspection is conducted.

On-site Inspection. On National Forest System lands, the FS coordinates the on-site inspection. Participants would normally include the FS, applicant, dirt contractor and drilling contractor. Other participants might include BLM, other agency representatives, and/or other interested parties. During the on-site inspection, the FS and the applicant meet at the site to determine if any site specific operating requirements over and above those in the lease need to be included in the application approval.

APD Option. The APD provides operational and geologic information as well as the applicants proposal for use of the surface. Bonding coverage must be obtained by the applicant before approval and the applicant must either have record title, operating rights or be designated operator by the individuals having authority make such designations.

The APD includes a Drilling Plan and a Surface Use Plan of Operations. The Drilling Plan includes specific information concerning the drilling, casing and cementing programs. The applicants proposal for use of the surface is provided in the Surface Use Plan of Operations. This plan provides a detailed description of the existing roads, proposed access road location and design, location of existing wells, proposed production facilities, water supply, construction materials, waste disposal, ancillary facilities, well site layout, plans for surface reclamation, surface ownership, lessee's or operator's representative and any other additional information that may be helpful in processing the APD. If the application process starts with the filing of an APD, then the on-site inspection is scheduled and the surface use plan is reviewed on-site.

NOS Option. A NOS is a simple notice that a proposed well site has been staked. It includes general information concerning the name and address of the operator and the well name and location. It also includes an appropriate map. Upon receipt of the NOS, an on-site inspection is conducted. The inspection is the basis for the contents of the Surface Use Plan contained in the APD, which under this method, is filed after the inspection

Environmental Review. Once a complete APD is submitted, the FS, in conjunction with the BLM, conducts an environmental analysis of the proposed operation and prepares an appropriate environmental document under the National Environmental Policy Act of 1969 (NEPA). The appropriate level of analysis and type of NEPA documentation will be based on the nature and scope of individual proposals. On existing leases, the lessee has the right to explore the leasehold. The analysis does not determine whether leasing will or will not occur. This allocation is made through the Forest Plan or other leasing analyses Site specific analysis of the proposal does determine the best means of drilling from an environmental standpoint and is the basis for conditions of approval relative to resource protection and/or enhancement.

The Forest Service is designated as the lead agency for the environmental analysis of a proposed drilling operation occurring on national forests and is responsible for completion of the NEPA document relative to the surface resources. BLM is designated as a cooperating agency and completes the document relative to the subsurface resources (Geologic Hazards, Ground Water and Other Mineral Resources), and other surface/subsurface resources that may be impacted due to technical drilling/production operations Results of public scoping and Forest Service/BLM input would be considered in the analysis Mitigating measures above those stated in the lease stipulations may be needed and applied to the application to insure protection of resources Such conditions will be included in the application approval as "conditions of approval."

Upon completion of the NEPA document, the FS will complete a decision document pertaining to the approval/disapproval of the Surface Use Plan and the BLM will complete a decision document for approval/disapproval of the APD.

Development. A producing well will generate additional drilling to determine the size and extent of the field. Associated with this phase are more roads (some upgraded to all-weather travel), utility corridors for pipelines and powerlines, and space for storage tanks and gas/water separators.

Production Facilities. If the well is a producer, then a portion of the original site is needed for continued access to the well for the life of the well (10 years to 30 years). Areas of the drill site no longer needed for production are reclaimed and the site stabilized to prevent soil erosion. The well will then wait for construction of a pipeline into the site, often following the access road corridor. Commonly, producing wells are temporarily capped, awaiting a pipeline to be built into the region. Producing well sites will normally have a metal pipe with valves exiting from the well (commonly called a "Christmas tree"), a small tank to collect trace amounts of oily residue, and a gas/liquid separator on the pipeline. With more producing wells there will be the need for facilities to produce, treat, and transport the natural gas. From the well, the gas would flow through flowlines to a production/treatment facility

Dehydrators and separators are used to separate the gas and water. This facility is typically located near the well. Meters are used to measure the amount of gas produced before it is put into a transmission pipeline. Any produced water would be temporarily stored in tanks and must be properly disposed of according to federal and state standards. In some cases the water is removed from the site and disposed of by injection into an injection well. Once treated, the gas is sold and transmitted by pipeline.

Pipelines transport gas from the production facility to a trunk line and then to the main transmission line from the area. Trunk lines are generally 6 to 8 inches in diameter and are buried, as are transmission lines which vary in diameter from 10 to 36 inches The area required to construct a flowline or pipeline varies depending on size of pipe, topography, and whether road corridors are used Normally, gathering and trunk flow lines require about 25 feet to 40 feet of right-of-way. Larger transmission lines can require more space for construction

Well Spacing. The spacing of the wells from one another depend on the State's regulations and the type of hydrocarbons found Maximum spacing of gas wells in Virginia is one per half-mile radius for wells deeper than 3,000 feet

Development Analysis and Decision Making. Based on the exploration results, a lessee may want to develop a field. Each proposed well site and subsequent operation must be proposed through submittal of an application to the BLM. The method used to approve operations and the installation of facilities subsequent to drilling depends on whether or not the facility is part of the leasehold operation. All facilities used for production, treatment and transmission of oil and gas are considered leasehold facilities to the point where the product is sold. This includes facilities that are off lease and authorized under an off lease storage permit. Such facilities include storage tanks and processing facilities, sales facilities, all pipelines upstream from such facilities, and other facilities to aid production such as water disposal lines, and gas or water injection lines

When subsequent operations require new construction, reconstruction, or alteration of existing facilities and surface disturbance will result the proposal for installation of such facilities is subject to the same type of environmental review process used prior to drilling The application is reviewed and evaluated by the Forest Service to assess the surface impacts of the proposal and appropriate NEPA documentation is prepared. The cumulative impacts of field development would be considered in the evaluation and in some cases an additional environmental analysis may be needed to assess the potential effects of full field development This type of analysis would assess the potential effects of field development, production activities and distribution facilities. If the cumulative impacts of the proposed development exceed the level

as projected in the Plan, then additional planning analysis will be required. The environmental analysis typically results in documentation in either an EA or EIS, depending on the scope of the proposal.

Pipelines and other facilities beyond the sales point must be approved by right-of-way permits, special use permits or permission of the land owner depending on the land ownership.

Abandonment and Reclamation. Well abandonment operations may not be started without prior approval of the BLM. In the case of newly drilled dry holes, failures, and in emergency situations, oral approval may be obtained from the authorized officer subject to written confirmation by application

Well plugging and abandonment requirements vary with the rock formations, subsurface water, well depth and other factors. Generally, however, the area below the surface casing is filled with heavy drilling mud and cement plugs are installed at various points to protect aquifers and known oil and gas producing formations. A cement plug is installed at the top of the surface casing. A pipe monument giving the location and name of the well is required unless waived If waived, the casing may be cut off below ground level.

A reclamation plan is included in the Surface Use Plan portion of the APD. If the well is a dry hole or commercial production ceases, then the entire site is restored according to the reclamation plan. Reclamation normally involves contouring of the site, spreading of stockpiled topsoil and a combination of seeding, mulching, liming, and fertilizing to revegetate the site. All surface equipment and facilities are removed. The access road will be reclaimed unless it has been determined that it is needed for Forest administrative purposes. All pits must be reclaimed to a natural condition similar to the rest of the reclaimed pad area. In addition, the reclaimed pit must be restored to a safe and stable condition. All other excavation or drill holes must be closed by backfilling once dry and graded to conform to the surrounding terrain.

Site preparation prior to seeding may include ripping, scarifying, contour furrowing, terracing, reduction of steep cut and fill slopes, waterbarring, etc. The disturbed sites should be prepared to provide a seedbed for re-establishment of desirable vegetation and reshaped to blend with the natural contour. Mulching, fertilizing, tree planting, fencing, or other practices may be required.

Reclamation and abandonment of pipelines and flowlines may involve replacing fill in the original cuts, reducing and grading cut and fill slopes to conform to the adjacent terrain, replacement of surface soil material, waterbarring and revegetating in accordance with normal rehabilitation practices.

Before the period of liability of the bond is terminated, the Forest Service must be satisfied that the drill site and road have been adequately rehabilitated. No new leases will be issued to a person or company who is in material non-compliance with reclamation requirements on existing leases.

IV. PROCESS FOR LEASING NON-ENERGY MINERALS

The following is a description of typical hardrock exploration and mining activities which could be expected on the George Washington National Forest.

Prospecting/Exploration

Prospecting is usually performed by a company or independent geologist. Activities include ground reconnaissance, aerial observations, geochemistry, soil sampling, and removal of small amounts of rock samples with hand tools. Preliminary mineral reconnaissance is also referred to as minerals exploration. On acquired status national forest lands, a prospecting permit is required for this type of exploration. This permit is applied for and issued by the Bureau of Land Management (BLM) in Alexandria, Virginia. (The

Forest Service also can issue a prospecting permit for certain limited types of prospecting activities). Prior to issuance of a permit, the permit applicant must provide an exploration plan detailing the proposed methods and timing of exploration activities. This plan is reviewed by both the BLM and the Forest Service to assure that regulatory requirements are met. Appropriate environmental documentation is prepared prior to any decision to permit exploration activities. Also, a bond must be submitted by the permittee in an amount sufficient to cover rental and estimated reclamation costs. The minimum bond for a prospecting permit is $1,000.

The selection of an area for detailed exploration occurs after the initial prospecting stage. In the exploration stage, an intensive geological, geochemical, and geophysical survey may be made to determine the size, shape, and quality of the mineral occurrence. Surveys may include trenches, pits, core drilling, underground exploration of existing mines and adits, bulk sampling, pilot testing of minerals for appropriate milling procedures, and feasibility studies to determine the project potential. Low level exploration activities may simply be an extension of the prospecting phase, involving cross-country and/or helicopter access for equipment needed to perform preliminary drilling and trenching purposes Typically, secondary exploration activities involve heavy equipment such as backhoes for trenching, dozers for construction of new exploration access routes and construction of drill pad sites, and drilling equipment. Sites are normally occupied for short periods of time (often two to four weeks) and specifically for exploration purposes. Therefore, surface impacts are generally low Where typical exploration activities take place, extensive restoration practices are generally not necessary. Explosives may be used in connection with these activities on a limited basis. All exploration activities on acquired status lands must be approved by the BLM under a prospecting permit. If the initial exploration plan submitted during the application process does not include proposed secondary exploration, a modification must be submitted and approved prior to the start of any exploration activity. This plan will be reviewed by both the BLM and Forest Service and appropriate environmental documentation will be prepared prior to approval. An increase in the initial bond amount may be necessary at this stage.

Mining Development and Production.

Development and production of the mineral resources are done under a Federal mineral lease. The prospecting and exploration work that was done under the BLM prospecting permit must support a valuable discovery determination If such a determination can be made by the BLM, a preferred right mineral lease may be issued to the prospective applicant The Forest Service must concur before the lease can be issued. The lease will set forth the terms and conditions under which the mineral may be developed. Upon issuance of a lease, a mine plan must be submitted for approval prior to the start of any operations.

The decision to mine the deposit is based on the success of the exploration program. If the outcome of the exploration program reveals the presence of a commercially viable ore deposit, then the next step is to progress to the development stage. During the development phase, preparations are made which will allow the deposit to be mined. Additional trenching or drilling may be necessary to more precisely delineate the ore body. This will assist in determining the optimum location of the ancillary facilities which will enable the deposit to be efficiently mined and processed. Adits may be driven in underground operations and overburden may be removed in surface operations during the development phase. If necessary, outside financing is typically sought during this phase. Actual mining and milling of the ore occurs in the production phase. Operations in the development and production phases will require concurrence from the FS and approval from the BLM. Mine plans must be submitted to the BLM and appropriate environmental documentation will be prepared prior to any activity. The BLM will coordinate review of the mine plan with the Forest Service. Also, a bond must be submitted by the lessee in an amount sufficient to cover rental, estimated royalties and reclamation. BLM will consult with the Forest Service on the calculation of reclamation costs. The minimum bond for hardrock leases is $5,000.

Abandonment and Reclamation.

Full site reclamation is required when any mining related operation is completed In addition, reclamation commensurate with active mining is required on those portions of an operating area that are no longer utilized. Routine compliance inspections conducted by the BLM and Forest Service help to insure that reclamation measures addressed in the approved plan will be effective when the operation is completed. Reclamation under prospecting permits and leases is the responsibility of the BLM. The Forest Service, as the surface management agency, works closely with the BLM to insure that appropriate reclamation measures are conducted. The period of liability under the reclamation bonds for either prospecting permits or leases will be terminated upon completion of reclamation work as outlined in the approved exploration or mine plan. Final reclamation work will be inspected by both the BLM and Forest Service for compliance prior to bond release. Reclamation criteria include the following:

Recontouring.
Stabilization of the ground.
Conservation of the topsoil and addition of appropriate fertilizers.
Revegetation with prescribed seed mixtures.
Air, Water, and visual quality standards.
Compliance inspection intervals and bond amounts.
Conditions for bond release.

If the BLM determines that the lands of interest contain a known deposit and do not need to be explored under a prospecting permit, that agency has the option to put those lands up for competitive bid. A competitive lease is structured similar to the non-competitive lease issued after a prospecting permit with the important distinction that through the competitive process additional revenue is raised.

V. PROCESS FOR DISPOSAL OF SALABLE MINERALS

The Forest Service has total discretion for the permitting, sale, and free-use disposal of salable or "common variety minerals" on national forest land Common variety minerals on the George Washington NF are typically low unit value mineral resources such as shale, sand, gravel, limestone, sandstone, and others. Application to obtain or purchase salable minerals are made directly to the Forest Service, usually at the district ranger level Depending on the type of disposal requested, a NEPA analysis may be done to determine if any environmental impacts will occur as a result of the activity. Most common variety mineral permits granted are for small tonnages (5 tons or less) of rock for home use including walkways, driveways, walls, etc... Small tonnage sales or free-use disposals of surface rock generally cause minimal or no surface disturbance. Shale is usually taken from existing Forest Service pits along roads. Larger volume disposals are typically taken for road projects by the local government agencies and are usually given free of charge also because they benefit the local communities.

In the case of larger sales or exploration for unknown deposits for commercial use, competitive bids may be required depending on the size and whether other competition is possible. If competitive bids are not required for sale of material, the price is set at market based rates. In these cases, a more detailed operating plan and an environmental analysis is required. If a large site is approved, the developer is required to have an approved reclamation plan and post sufficient bond to cover such a plan All monies generated from the sale of salable minerals are dispersed as are monies from leasable minerals: 65% to Treasury, 25% to State, 15% to Trails fund.

VI. REASONABLY FORESEEABLE DEVELOPMENT SCENARIO ANALYSIS FOR GAS/OIL

The projection of areas of likely gas (and oil) drilling over the planning period is the "Reasonable Foreseeable Development Scenario" (RFDS). The RFDS is a projection of the likelihood of gas exploration, development, production and related activities within the analysis area. The projections are speculative but are based upon credible geologic and mineral production information. This is not a worst-case scenario based upon legal spacing. The projections must take into account existing limitations currently applied to oil and gas exploration and development. The RFDS is for the most part concerned with development potential within the analysis area and over the life of the planning period. The projected number of wells to be drilled in the RFDS establishes a baseline upon which to compare impacts of gas (and oil) related activity in the proposed alternatives.

The RFDS has been jointly developed by the USDI Bureau of Land Management and the U S. Forest Service for the George Washington NF. It is divided into the following subsections:

Development in the Reasonably Foreseeable Future
Typical Well Design in the George Washington National Forest
Cumulative Disturbance of Projected Future Development

Table on Approximate Area Disturbed from Drilling
Table on Approximate Area Disturbed from Production

Development in the Reasonably Foreseeable Future

Development in the reasonably foreseeable future is based on an analysis of geologic data, industry viewpoints, activity trends, and coordination with subject matter experts in the Virginia and West Virginia State Geologic Surveys. Anticipated activity levels for minerals vary by alternative. However, the range in activity levels is not large due to a variety of reasons. Several federal laws and departmental regulations provide for the leasing and accessibility of the federal mineral estate for exploration and development to help meet this country's demand for resources. In general, the U.S. Forest Service's policy is to make National Forests open for proposals to lease and develop minerals in coordination with the other Forest resources. Accessibility to the mineral estate is a key point to consider in planning and analysis. Unlike timber and other surface resources which can been easily inventoried and mapped, mineral resources require certain exploration attempts to define their location, quality, and quantity

The main difference by alternative for the minerals issue is the amount of land which is accessible for potential mineral activities and the constraints placed on mineral development for those lands that are accessible for minerals. This does not mean that if the entire Forest were accessible for minerals, then development would be commonplace Exploration and development activities are dependent on geologic conditions and the influence of markets and pricing. To illustrate this point consider that under the existing Forest Plan management area guidelines about 790,000 acres are available for mineral leasing on the George Washington National Forest but less than 62,000 acres are actually leased.

Past Activity

Drilling activity on federal leases on the Forest in the last fifteen years consists of only four wells being drilled. These activities have impacted between 5-10 acres, all of which is now reclaimed and vegetated. Conversely, if gas prices were to rise dramatically, the number of new drilling applications could be significant. If gas were discovered then the development phase of a gas field requiring more wells, roads, and transmission and gathering pipeline facilities could be expected.

There have been past successful drilling attempts for natural gas from two known producing areas within the Forest's proclamation boundary. These are the Bergton-Crab Run Anticline on the Dry River District in northern Rockingham County, Virginia and the Thornwood-Horton Field in Highland County, Virginia, Pendleton and Pocahontas Counties, West Virginia.

The Bergton Gas Field was discovered in 1935. By 1983, twenty-four wells had been drilled, all on private land. Of these twenty-four wells, ten were completed as "producers". Gas was found in an anticlinal structure within the Devonian-aged Oriskany Sandstone in the 4,000 to 5,000 foot depth range. In the early 1980s, a pipeline was constructed into the area and parts of the Bergton Field produced gas until 1986. Currently, there is no production.

The Thornwood-Horton Gas Field in West Virginia/Virginia also has known gas potential. Gas reserves were discovered at roughly 5,200 feet within a faulted anticlinal structure in Devonian Oriskany Sandstone. Drilling began in 1961 and ceased in 1964 on the neighboring Monongahela National Forest in West Virginia. Five gas wells were drilled in this structure. The Thorton-Horton field is near the Laurel Fork area of the Warm Springs Ranger District. A federal lease containing 2,168 is within the known structure of the field and is being held under a communitization agreement with the BLM. Currently, the wells are shut-in in this largely remote field.

The Lost River Field (Whip Cove East), which lies several miles west of the Forest Proclamation boundary in Hardy County , W. Virginia, is another nearby known gas field. The field was discovered in 1962 and eleven wells were drilled up until 1965. The field produced 9,143,679 MCF of gas until 1973. Presently, the field is used as a gas storage area. Natural gas is injected and stored underground during the warm, low use seasons, and withdrawn during the peak demand, colder months to be transported to markets in the northeast.

In other areas of the Forest, drilling results have been less encouraging. Four exploratory holes have been drilled on the Forest in Rockingham County, all being classified as dry holes.

Present Activity

Currently, about 62,000 acres of the Forest are leased on 33 issued oil and gas leases, but no drilling is being done. Recent interest and seismic activity have centered along the West Virginia boundary in Highland County, on the Warm Springs Ranger District.

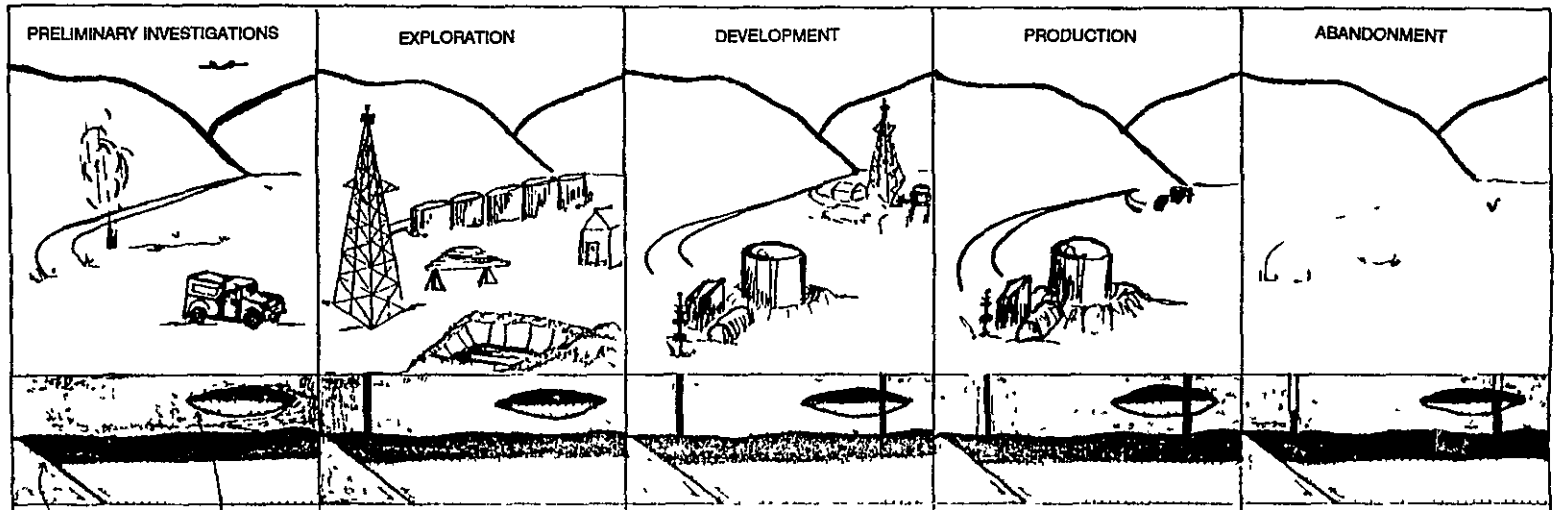
Typical Well Design in the George Washington National Forest

On the Forest, most wells must be drilled to depths of 3,000 to 10,000 feet or more to intercept the possible target horizons. A typical well requires construction of a level drill pad, reserve pit, and access road. The total well site area including the well pad and pit normally occupies about 3/4 of an acre. This is based on the prediction that gas drilling would be in the 5,000 foot range. An exception to this might be if a company were to try to drill a very deep wildcat well to test deeper formations. Deeper drilling to 10,000 feet or more can require several acres of land for storage of pipes and supplies and the creation of a larger reserve pit. The dimension and layout of a well site also vary based on the natural contour of the land, and the resources involved. The well site layout is oriented to conform to the best topographic situation given the geologic target and any safety considerations. Generally, cut and fill slopes on the perimeter of the well pad are not to exceed 3:1 (one foot vertical for three foot horizontal). If appropriate, terraces can be used on cut and fill slopes to prevent excessive water accumulation and erosion.

Access roads for oil and gas operations are generally low volume, single-lane roads, which may be reclaimed after a particular use terminates These roads normally have a 14 foot traveled way, 16 foot

roadbed, 30 foot construction limit, and would be surfaced with shale or similar material. In the planning area, the average length of a typical access would be 1/2 mile. For the drilling phase, these roads may be constructed for dry weather use. Should production be established, the road must be surfaced, drained and maintained for all weather use.

Following are diagrams of typical drilling set up and the outline of the dimensions of a drill site.



Preliminary investigations are conducted when a company suspects gas to be present in an area The following types of data may be collected
- Airborne Surveys
  - Aeromagnetic
- Surface Surveys
  - Geochemical Survey
  - Geologic Mapping
  - Geophysical Survey
    - Thumper Method
    - Explosive Method
    - Vibrator Method

Once a company decides to drill a prospect access, routes and a drill site have to be established The drill site will include a drill rig, mud pits and a tank battery Wells drilled to untested prospects are referred to as "wildcat wells"

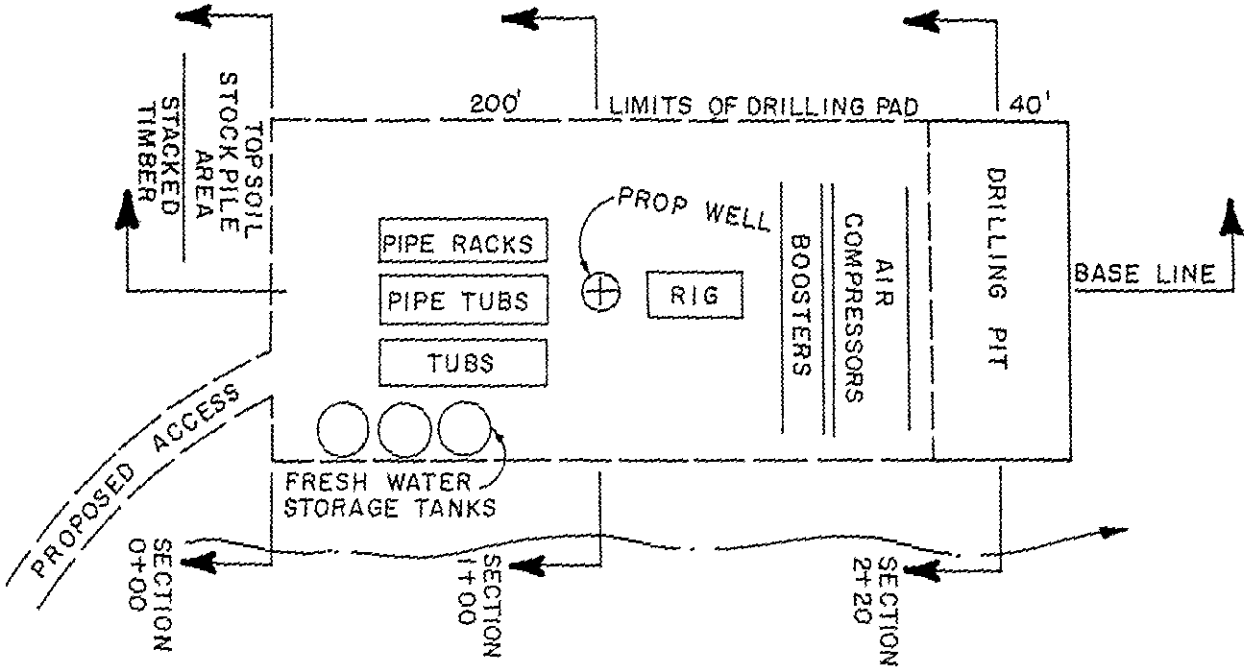
If the wildcat well discovers gas, and recovery is economically feasible the field is developed for production Stepout and development wells are drilled Buildings, pipelines and other facilities are put in place

Operation and maintenance of field, continued drilling, installation of pressure maintenance system, disposal of waste, secondary and tertiary recovery, workovers, are typical of the production phase

Removal of equipment and facilities, field cleanup, well abandonment and plugging, elimination of hazards, and surface reclamation (landscaping, reseeding and erosion control) are typical abandonment activities

DIAGRAM 1: Sequence of Operations in a Gas Field, a Pictorial

Diagram 2.
Typical Well Site Plan



NOT TO SCALE
Approximately 1/2 to 1 acre in size
TYPICAL WELL SITE PLAN

Cumulative Disturbance of Projected Future Development

Cumulative surface disturbances to the Forest environment can be determined based on assumptions and analysis of the RFDS. The assumptions for this projection are arrived at by looking at historic trends in the oil and gas industry, oil and gas operations in other parts of Virginia and West Virginia, and the Forest's potential for oil or gas. The tables on the following pages are an attempt to show the approximate area disturbed from drilling and production under a low, medium, and high activity level. The different activity levels could change on parts of the Forest due to a number of variables including:

successful drilling attempts on nearby lands;
large increase in the price of natural gas;
new technologies to make marginal gas deposits economic;
construction of interstate transmission gas pipelines.

The following tables serve as a baseline on which to compare the alternatives. They do not take into account the effect that limitations, land withdrawals, or restrictive special stipulations may have on the projected number of wells, acres disturbed, etc. in the areas being considered The tables are based soley on potential for natural gas evaluated under different "industry activity levels." These levels are in turn determined by gas prices, availability of transmission lines for gas, national efforts for energy use or conservation, etc. Alternatives which generally are more restrictive for mineral resources could have fewer wells attempted and acres disturbed.

Each ranger district is evaluated under these scenarios. The gas (and oil) potential for much of the George Washington National Forest is highly speculative as very little drilling has occurred. As a result, the projections of future development must be viewed as a range of potential development rather than a single scenario.

The following assumptions are used in tables E-1 and E-2.

-The maximum area cleared for the dirlling of one well would normally be 1 acre.

-The maximum area needed per producing well is normally 1/2 acre.

-The average length of access road per well would be 1/2 mile, the maximum width of the access road would be 30 feet. The amount of acreage disturbed by road-building per well is 2 acres.

-The average length of a gas gathering pipeline would be about one mile. Gas gathering line rights-of-way widths would be 25 feet and follow existing roads for the most part. The amount of acreage disturbed per producing well is 3 acres.

Table E-1.
Approximate Area Disturbed from Drilling

Ranger District	Level of Industry Activity for Oil/Gas Drilling Low	Medium	High
Deerfield RD	----------No Activity Expected----------		
Dry River RD			
Number of wells			2
Producers			0
Dry Holes			2
Well Pad	-----No Activity Expected----		2 acres
Access Road			4 acres
Total			6 acres
James River RD			
Number of wells			1
Producers			0
Dry Holes			1
Well Pad	-----No Activity Expected----		1 acres
Access Road			2 acres
Total			3 acres
Lee RD			
Number of wells			2
Producers			2
Dry Holes			0
Well Pad	-----No Activity Expected----		2 acres
Access Road			4 acres
Total			6 acres
Pedlar RD	----------No Activity Expected----------		
Warm Springs RD			
Number of wells		2	5
Producers	No	2	4
Dry Holes	Activity	0	1
Well Pad	Expected	2 acres	5 acres
Access Road		4 acres	10 acres
Total		6 acres	15 acres
Total Wells Projected	0	2	10
Total Producers	0	2	6
Total Dry Holes	0	0	4
Total Area for well pad	0 acres	2 acres	10 acres
Total Area for roads	0 acres	4 acres	19 acres
Total Area disturbed	0 acres	6 acres	29 acres

Table E-2.
Approximate Area Disturbed from Production

Ranger District	Level of Industry Activity for Oil/Gas Production Low	Medium	High
Deerfield	----------No Activity Expected----------		
Dry River	----------No Activity Expected----------		
James River RD	----------No Activity Expected----------		
Lee RD			
Number of wells			2
Well Pad			1 acre
Access Road*	-----No Activity Expected----		4 acres
Flowlines			6 acres
Total			11 acres
Pedlar RD	----------No Activity Expected----------		
Warm Springs RD			
Number of wells		2	4
Well Pad	No	1 acres	2 acres
Access Road*	Activity	4 acres	8 acres
Flowlines	Expected	6 acres	12 acres
Total		11 acres	22 acres
Total Well Area	0 acres	1 acres	3 acres
Total Access Roads*	0 acres	4 acres	12 acres
Total Flowlines	0 acres	6 acres	18 acres
Total Area Disturbed	0 acres	11 acres	33 acres

*Roads here are those already accounted for during drilling stage

EXHIBIT 1 - The No Surface Occupancy Stipulation

The No Surface Occupancy (NSO) stipulation is intended for use only when other stipulations are determined insufficient to adequately protect the public interest. The land use plan/NEPA document prepared for leasing must show that less restrictive stipulations were considered and determined by the authorized officer to be insufficient. The planning/NEPA record must also show that consideration was given to a no-lease alternative when applying a NSO stipulation A No Surface Occupancy Stipulation is not needed if the desired protection would not require relocation of proposed operations by more than 200 meters (43 CFR 3101.1-2).

The legal subdivision, distance, location, or geographic feature, and resource value of concern must be identified in the stipulation and be tied to a land use plan and/or NEPA document. Land description may be stated as: the "Entire Lease," Distance from resources and facilities such as rivers, trails, campgrounds, etc.; legal description; geographic feature such as the 100-year floodplain, municipal watershed, percent of slope, etc.; Special Areas with identified boundaries -- area of critical environmental concern, Wild and Scenic River, etc., or other description that specifies the boundaries of the lands affected. The estimated percent of the total lease area affected by the restriction must be given if no legal or geographic description of the location of the restriction is given. In other cases the estimated percent is optional

Land use plans and/or NEPA documents should identify the specific conditions for providing waivers, exceptions, or modifications to lease stipulations. Waivers, exceptions, or modifications must be supported by appropriate environmental analysis and documentation, and subject to the same test used to initially justify the imposition of this stipulation Language may be added to the NSO stipulation form to provide the lessee with information or circumstances under which waivers, exceptions, or modifications would be considered. A waiver, exception, or modification may be approved if the record shows that circumstances or relative resource values have changed or that the lessee can demonstrate that operations can be conducted without causing unacceptable impacts, and that less restrictive stipulations will protect the public interest. Waivers, exceptions or modifications can only be granted by the authorized officer. If the waiver, exception, or modification is inconsistent with the land use planning document, that document must be amended as necessary, or the change disallowed.

If the authorized officer determines, prior to lease issuance, that a stipulation involves an issue of major concern, modification or waiver of the stipulation will be subject to public review (43 CFR 3101.1-4). The land use plan may also identify other cases when a public review is required for waiver, exception, or modification In such cases, wording such as the following should be added to the stipulation form to inform the lessee of the required public review. A 30-day public notice period is required prior to modification or waiver of this stipulation."

EXHIBIT 1

Serial No._____

NO SURFACE OCCUPANCY STIPULATION

No surface occupancy or use is allowed on the lands described below (legal subdivision or other description).

For the purpose of:

Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manual 1624 and 3101 or FS Manual 1950 and 2820.)

Form #/Date

EXHIBIT 2 - The Timing Limitation Stipulation

The Timing Limitation (often called seasonal Stipulation prohibits fluid mineral exploration and development activities for time periods less than year-long. When using this stipulation, assure that date(s) and location(s) are as specific as possible. A timing stipulation is not necessary if the time limitation involves the prohibition of new surface disturbing operations for periods of less than 60 days (43 CFR 3101.1-2).

The land use plan/NEPA document prepared for leasing must show that less restrictive stipulations were considered and determined to be insufficient. The environmental effects of exploration, development, and production activities may differ markedly from each other in scope and intensity. If the effects of reasonably foreseeable production activities necessitate timing limitation requirements, this need should be clearly documented in the record. The record should also show that less stringent, project-specific mitigation may be insufficient. In such cases the stipulation language should be modified on a case-by-case basis to clearly document that the timing limitation applies to all stages of activity.

The legal subdivision, distance, location, or geographic feature, and resource value of concern must be identified in the stipulation and be tied to a land use planning and/or NEPA document. The timing limitations for separate purposes may be written on separate forms or as one combined stipulation. During the review and decision-making process for APDs and Sundry Notices, the date(s) and location(s) should be refined based on current information.

Land use plans and/or NEPA documents should identify the specific conditions for providing waivers, exceptions, or modifications to lease stipulations. Waivers, exceptions, or modifications of this stipulation such as continuing drilling operations into a restricted time period, must be supported with appropriate environmental analysis and documentation, and will be subject to the same test used to initially justify the imposition of this stipulation. Language may be added to the stipulation form to provide the lessee with information or circumstances under which waiver, exception, or modification would be considered. The need for one-time, case-by-case exceptions of timing limitation stipulations may arise from complications or emergencies during the drilling program. The need for timely review and decision-making is great in such cases. For this reason, it is desirable that land use plans/NEPA documents clarify what review procedures and other requirements, if any, will apply in such cases

A waiver, exception, or modification may be approved if the record shows that circumstances or relative resource values have changed or that the lessee can demonstrate that operations can be conducted without causing unacceptable impacts, and that less restrictive stipulations will protect the public interest. Waivers, exceptions or modifications can only be granted by the authorized officer. If the waiver, exception, or modification is inconsistent with the land use planning document, and that document does not disclose the conditions under which such change will be allowed, the plan or NEPA document must be amended as necessary, or the change disallowed

If the authorized officer determines, prior to lease issuance, that a stipulation involves an issue of major concern, modification or waiver of the stipulation will be subject to public review (e.g., 43 CFR 3101.1-4). The land use plan may also identify other cases when a public review is required for waiver, exception, or modification. In such cases, wording such as the following should be added to the stipulation form to inform the lessee of the required public review: "A 30-day public notice period is required prior to modification or waiver of this stipulation."

EXHIBIT 2

Serial No _____

TIMING LIMITATION STIPULATION

No surface use is allowed during the following time period(s). This stipulation does not apply to operation and maintenance of production facilities

On the lands described below:

For the purpose of (reasons):

Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manual 1624 and 3101 or FS Manual 1950 and 2820.)

Form #/Date

EXHIBIT 3 - The Controlled Surface Use Stipulation

The Controlled Surface Use (CSU) Stipulation is intended to be used when fluid mineral occupancy and use are generally allowed on all or portions of the lease area year-round, but because of special values, or resource concerns, lease activities must be strictly controlled This stipulation replaces stipulations commonly referred to as Limited Surface Use Stipulations The CSU Stipulation is used to identify constraints on surface use or operations which may otherwise exceed the mitigation provided by Section 6 of the standard lease terms and the regulations and operating orders. The CSU Stipulation is less restrictive than the NSO (No Surface Occupancy) or Timing Limitation stipulations, which prohibit all occupancy and use on all or portions of a lease for all or portions of a year. The CSU Stipulation should not be used in lieu of an NSO or Timing Limitation Stipulation. The use of this stipulation should be limited to areas where restrictions or controls are necessary for specific types of activities rather than all activity.

The stipulation should explicitly describe what activity is to be restricted or controlled, or what operation constraints are required, and must identify the applicable area and the reason for the requirement. The record must show that less restrictive stipulations were considered and determined to be insufficient. The legal subdivision, distance, location, or geographic feature, and resource value of concern must be identified in the stipulation and be tied to a land use plan and/or NEPA document.

Land use plans and/or NEPA documents should identify the specific conditions for providing waivers, exceptions, or modifications to lease stipulations. Waivers, exceptions, or modifications of this stipulation must be supported with appropriate environmental analysis and documentation, and will be subject to the same test used to initially justify the imposition of this stipulation. Language may be added to the stipulation form to provide the lessee with information or circumstances under which waiver, exception, or modification would be considered. A waiver, exception, or modification may be approved if the record shows that circumstances or relative resource values have changed or that the lessee can demonstrate that operations can be conducted without causing unacceptable impacts, and that less restrictive stipulations will protect the public interest Waivers, exceptions or modifications can only be granted by the authorized officer. If the waiver, exception, or modification is inconsistent with the land use planning document, that document must be amended as necessary, or the change disallowed.

If the authorized officer determines, prior to lease issuance, that a stipulation involves an issue of major concern, modification, or waiver of the stipulation will be subject to public review (43 CFR 3101.1-4). The land use plan may also identify when a public review is required for waiver, exception, or modification. In such cases, wording such as the following should be added to the stipulation form to inform the lessee of the required public review: "A 30-day public notice period is required prior to modification or waiver of this stipulation."

EXHIBIT 3

Serial No._____

CONTROLLED SURFACE USE STIPULATION

Surface occupancy or use is subject to the following special operating constraints.

On the lands described below:

For the purpose of (reasons):

Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes. (For guidance on the use of this stipulation, see BLM Manual 1624 and 3101 or FS Manual 1950 and 2820.)

Form #/Date

Appendix F - Environmental Impact Statement
THREATENED, ENDANGERED, AND SENSITIVE SPECIES

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VASCULAR PLANTS

SCIENTIFIC NAME - COMMON NAME	RANK: GLOBAL	RANK. VANHP/ WVNHP	STATUS STATE/ FEDERAL		KNOWN OCCURRENCES BY DISTRICT LOCATION(S)							HABITAT
			VA	FED	LTO*	DF	DR	JR	LE	PD	WS	
Aconitum reclinatum - white monkshood	G3	S3/S2S3				X						MT MW
Agropyron trachycaulum - slender wheatgrass	G5	S1/S4				X	X					RO DW
Allium oxyphilum - nodding onion	G3Q	S1?/S1	3C			X	X	X	X		X	SB
Alnus rugosa - speckled alder	G5	S2/S4			X							WL RI
Anemone canadensis - Canada anemone	G5	S1/S1			X							MW
Arabis hirsuta - hairy rockcress	G5	S1/S2								X		SB DW
Arabis serotina - smooth rockcress	G2	S2/S1	E	E		X	X	X	X		X	SB
Aralia hispida - bristly sasparilla	G5	S2/S4							X			MT RO
Arethusa bulbosa - bog rose	G4	S1/NA								X		WL
Aster radula - rough-leaved aster	G5	S1/S4			X							WL RI
Aster schistosus - shale barren aster	G4Q	SU/NA		C2							X	SB
Astragalus distortus - bent milkvetch	G5	S1/S2							X			SB
Baptisia australis - blue false indigo	G5?	S2/S4							X			RO RI
Betula papyrifera - paper birch	G5	S2/S2					X					MT MW
Blephilia hirsuta - hairy woodmint	G4?	S2/S?									X	RI MW
Boltonia asteroides - aster-like boltonia	G5	S2/NA								X		SP
Bouteloua curtipendula - side-oats grama	G5	S4/S3					X					GL
Bromus ciliatus - fringed brome	G5	S1/S5			X							WL
Bromus kalmii - wild chess	G5	S1/NA				X						SB DW
Camassia scilloides - wild hyacinth	G4G5	S2S3/S3S4			X							RI
Campanula rotundifolia - American harebell	G5	S1/S2					X					RO
Carex arctata - black sedge	G5?	S1/NA			X							MW
Carex barrattii - Barratt's sedge	G3	S1S2/NA		3C						X		SP
Carex buxbaumii - brown bog sedge	G5	S2/S2			X							WL SP
Carex conoidea - field sedge	G4	S1S2/S1			X							WL
Carex eburnea - ebony sedge	G5	S4/S3S4			X							RO
Carex hirtifolia - pubescent sedge	G5	S2/S1?						X				MW

*likely to occur

VASCULAR PLANTS

SCIENTIFIC NAME - COMMON NAME	RANK. GLOBAL	RANK VANHP/ WVNHP	STATUS STATE/ FEDERAL		KNOWN OCCURRENCES BY DISTRICT LOCATION(S)							HABITAT
			VA	FED	LTO*	DF	DR	JR	LE	PD	WS	
Carex hitchcockiana - Hitchcock's sedge	G5	S2/S?			X							DW MW
Carex interior - inland sedge	G5	S1/S4							X			WL
Carex leptonervia - finely-nerved sedge	G4	S2/S1									X	MW
Carex ormostachya - stiff broad-leaved sedge	G5	S1/NA			X							MT MW
Carex pedunculata - longstalk sedge	G5	S2/S1			X							DW
Carex polymorpha - variable sedge	G2	S2/S1	E	C2			X	X		X		MT DW
Carex tetanica - rigid sedge	G4G5	S2/S1?			X							WL
Carex trisperma - three seeded sedge	G5	S2/S4					X				X	WL
Carex vesicaria - inflated sedge	G5	S1S2/S1									X	WL
Cheilanthes castanea - chestnut lipfern	G3G4	S2/S1					X		X			SB
Cinna latifolia - slender wood reedgrass	G5	S2/S4							X		X	MT MW
Clematis albicoma - whitehaired leatherflower	G4	S2/S3S4		3C		X		X			X	SB
Clematis coactilis - Va whitehaired leatherflower	G3	S2S3/NA						X				SB RO
Clematis verticillaris - purple virgin's bower	G4G5	S3/S1			X							MT MW
Clematis viticaulis - grape-stem leatherflower	G2	S2/NA		C2		X	X	X	X		X	SB
Coreopsis verticillata - whorled tickseed	G5	S4/S2			X							DW
Cornus canadensis - bunchberry	G5	S1/S3					X					MT MW
Cornus obliqua - silky dogwood	G5?	S1/S4					X					WL RI
Cornus rugosa - roundleaf dogwood	G5	S2/S1							X			MW
Crategus prunosa - prunose hawthorn	G5	S1/SU			X							DW RO
Cyperus dentatus - toothed sedge	G4	S1/NA								X		SP WL
Cypripedium reginae - showy lady's slipper	G4	S1/S1							X			WL
Desmodium sessilifolium - sessile tick-trefoil	G5	S2/NA			X							DW
Diarrhena americana - American beakgrain	G5	S2S3/SU									X	RO DW
Eleocharis elliptica - slender spikerush	G5	S1S2/NA			X							WL
Eleocharis melanocarpa - black-fruited spikerush	G4	S2/NA								X		SP
Eleocharis robbinsii - Robbins spikerush	G4G5	S1/NA								X		SP
Eleocharis smallii - creeping spikerush	G5?	S1S2/S4			X							WL

*likely to occur

VASCULAR PLANTS

SCIENTIFIC NAME - COMMON NAME	RANK: GLOBAL	RANK: VANHP/ WVNHP	STATUS STATE/ FEDERAL		KNOWN OCCURRENCES BY DISTRICT LOCATION(S)							HABITAT
			VA	FED	LTO*	DF	DR	JR	LE	PD	WS	
Epilobium leptophyllum - linear-leaf willow-herb	G5	S2/S4			X							WL
Equisetum sylvaticum - woodland horsetail	G5	S1/S1							X			WL
Eriocaulon septangulare - white buttons	G5	S1/NA								X		SP
Erysimum capitatum - western wallflower												
Euphorbia purpurea - glade spurge	G2	S2/S2		C2	X							MW
Galium boreale - northern bedstraw	G5	S2S3/S4									X	DW RO
Gaylussacia brachycera - box huckleberry	G2	S1S2/S2		3C					X		X	DW
Geranium robertianum - herb-robert	G5	S1/S4?			X							MW
Geum aleppicum - yellow avens	G5	SH/S1			X							WL
Glyceria acutiflora - sharp scaled manna-grass	G5	S3/S1			X							WL
Gnaphalium uliginosum - low cudweed	G5	S1/NA					X					DW
Gylceria grandis - reed meadow-grass	G5	S1/S1									X	WL
Habenaria fimbriata - large purple-fringe orchid	G5	S1/S4			X							MW WL
Habenaria virdis var. *bracteata* - long-bracted green orchid	G5T5	S4/S2			X							WL RI
Helenium virginicum - Virginia sneezeweed	G2	S2/NA	E	C1						X		SP
Helianthemum bicknellii - plains frostweed	G5	S1/S1			X							DW RO
Helianthemum propinquum - low frostweed	G5	S1/NA			X							DW RO
Helianthus laevigatus - smooth sunflower	G3G4	S3/S2			X							SB DW
Helonias bullata - swamp pink	G2	S2/NA	E	T						X		WL
Heuchera alba - white-flowered heuchera	G2Q	S2?/S2				X	X	X	X	X	X	MT MW
Hexalectris spicata - crested coralroot	G3G4	S3/S1			X							DW RO
Hieracium traillii - Maryland hawkweed	G4?	S2S3/S4				X	X	X	X		X	SB DW
Iliamna remota - Kankakee globe-mallow	G5	S1/NA			X							RI
Iris versicolor - blueflag	G5	S2/NA			X							WL
Isoetes lacustris - lake quillwort	G5	S1?/NA							X			RI

*likely to occur

VASCULAR PLANTS

SCIENTIFIC NAME - COMMON NAME	RANK GLOBAL	RANK: VANHP/ WVNHP	STATUS STATE/ FEDERAL		KNOWN OCCURRENCES BY DISTRICT LOCATION(S)							HABITAT
			VA	FED	LTO*	DF	DR	JR	LE	PD	WS	
Isoetes virginica - Virginia quillwort	G1G2Q	S1?/NA		C2	X							SP
Juglans cinerea - butternut	G5	S3?/NA		C2		X	X	X	X	X	X	DW MW
Juniperus communis - ground juniper	G5	S1/S?					X					DW RO
Lachnanthes caroliana - Carolina redroot	G4	SH/NA			X							SP WL
Linum lewisii - prairie flax	G4G5	NA/S2					X					GL
Linum sulcatum - grooved yellowflax	G5	S2/S1			X							DW GL
Lipans loeselii - fen orchid	G5	S2/S2					X		X			WL
Lonicera canadensis - American fly-honeysuckle	G5	S2/S3S4									X	MT MW
Lycopodium inundatum - northern bog clubmoss	G5	S1/S3S4								X		WL
Lycopodium selago - fir clubmoss	G5	S2/NA			X							MT RO
Lysimachia radicans - trailing loosestrife	G4G5	S1/NA								X		WL MW
Lythrum alatum - winged-loosestrife	G5	S2/S1			X							WL
Melica nitens - tall melic grass	G5	S1/S1							X			SB DW
Milium effusum - tall millet-grass	G5	S1/S4				X	X	X	X		X	MT MW
Muhlenbergia glomerata - marsh muhly	G5	S2/NA			X							WL
Oenothera argillicola - shale barren evening primrose	G3	S3/S3				X	X	X	X		X	SB
Oryzopsis asperifolia - rough-leaved ricegrass	G5	S1/S1					X					DW
Oryzopsis racemosa - mountain ricegrass	G5	S4/S1			X							DW
Panax quinquefolius - American ginseng	G4	S4/S4	T	3C		X	X	X	X	X	X	MW
Panicum hemitomon - maidencane	G5?	S1/NA								X		SP
Panicum xanthophysum - a panic grass	G5	NA/SH			X							GL DW
Paronychia argyrocoma - silvery nailwort	G4	S3/S3				X	X	X	X	X	X	SB RO
Paronychia virginica var *virginica* - yellow nailwort	G4T1Q	S2/S1		C2	X							SB RO
Paxistima canbyi - Canby's mountain-lover	G2	S2/S2		C2					X			RO
Phlox buckleyi - swordleaf phlox	G2G3	S2/S1		3C		X	X	X	X		X	SB DW
Picea rubens - red spruce	G5	S3S4/S4S5					X				X	MW

*likely to occur

VASCULAR PLANTS

SCIENTIFIC NAME - COMMON NAME	RANK GLOBAL	RANK VANHP/ WVNHP	STATUS STATE/ FEDERAL		KNOWN OCCURRENCES BY DISTRICT LOCATION(S)							HABITAT
			VA	FED	LTO*	DF	DR	JR	LE	PD	WS	
Pieris floribunda - *mountain fetter-bush*	G4	S4/S2				X	X	X		X	X	MT DW
Poa languida - drooping bluegrass	G3G4	S2/NA				X	X					MT DW
Poa paludigena - bog bluegrass	G3	S2/NA		C2	X							WL
Poa palaustris - fowl bluegrass	G5	S1S2/S4			X							WL
Poa saltuensis - a bluegrass	G5?	S1/S2S3				X						DW
Poa wolfii - wolf bluegrass	G3G4	S1/NA			X							MW
Potamogeton oakesianus - Oakes' pondweed	G4	S1/NA								X		SP
Potamogeton tennesseensis - Tennessee pondweed	G3	S1/S3?					X					MP
Potentilla tridentata - three-toothed cinquefoil	G5	S2/S2			X							MT RO
Prunus allegheniensis - Allegheny sloe	G3	S2S3/S2S3		3C				X		X	X	SB DW
Prunus nigra - Canada plum	G4G5	S1/NA			X							MW RI
Pyrola chlorantha - green flowered wintergreen	G5	SH/NA			X							DW
Pyrola elliptica - elliptical shineleaf	G5	S2/S3S4			X							DW
Quercus macrocarpa - bur oak	G5	S1/S3S4			X							RI WL
Querus prinoides - *dwarf chinquapin oak*	G5	S2/S?			X							DW
Ranunculus trichophyllus - whitewater crowfoot	G5?	S1/SH							X			RI
Ribes lacustre - bristly black currant	G5	S1/S1					X					RI MW
Rosa setigera - prairie rose	G5	S1/S4			X							RI RO
Rubus idaeus - common red raspberry	G5	S2/NA			X							MT
Saagittaria rigida - sessile-fruited arrowhead	G5	S1/S2			X							SP WL
Saxifraga pensylvanica - swamp saxifrage	G5	S3/S2			X							WL
Schizachne purpurascens - *purple oat-grass*	G5	S1/S1									X	MW
Scirpus ancistrochaetus - northeastern bulrush	G1	S1/S1	E	E			X	X				MP
Scirpus subterminalis - water bullrush	G4G5	S1/NA								X		MP
Scirpus torreyi - Torrey bullrush	G5?	S1/S?								X		SP
Scutellaria ovata - var. *pseudoarguta* - heart leaved skullcap	G5T1Q	S?/S1Q			X							DW SB

*likely to occur

VASCULAR PLANTS

SCIENTIFIC NAME - COMMON NAME	RANK GLOBAL	RANK· VANHP/ WVNHP	STATUS STATE/ FEDERAL		KNOWN OCCURRENCES BY DISTRICT LOCATION(S)							HABITAT
			VA	FED	LTO*	DF	DR	JR	LE	PD	WS	
Scutellaria parvula var *parvula* - small skullcap	G4T?	S2/NA			X							SB
Sida hermaphrodita - Virginia mallow	G3	S1/S3		3C	X							RI
Smilacina stellata - false starflower	G5	S2/S1							X			RI
Solidago randii - Randy's goldenrod	G2G4	S2/SH			X							MT RO
Solidago harnsii - shale barren goldenrod	G3Q	S3S4/S3S4				X	X	X	X		X	SB
Solidago rupestris - rock goldenrod	G2?Q	S1/NA							X			RI RO
Solidago uliginosa - bog goldenrod	G4G5	S2/S4									X	WL
Sparganium chlorocarpum - narrow-leaf burreed	G5	S1/S3S4			X							WL SP
Spartina pectinata - fresh water cordgrass	G5	S2/S4			X							WL RI
Spiranthes ochroleuca - yellow nodding ladies tresses	G4	S2/NA					X					MW
Sporobolus neglectus - small dropseed	G5	S2/NA			X							DW RO
Trichostema setaceum - narrow-leaved blue curls	G5	S2/S1			X							DW SB
Trifolium virginicum - Kate's mountain clover	G2G3	S3/S2S3		3C		X	X	X	X		X	SB
Trillium pusillum var *monticulum* - mountain leas trillium	G3T1?	S2/S1		C2		X	X					MT DW
Triphora trianthophora - nodding pogonia	G4	S1/S3S4			X							MW
Vaccinum macrocarpon - large cranberry	G4	S2/S3								X		WL
Vaccinium myrtilloides - velvetleaf blueberry	G5	S2/S4			X							MT RO
Veronica scutellata - marsh-speedwell	G5	S2/S1			X							WL RI
Viburnum lentago - nannyberry	G5	S1/NA								X		WL
Viola walteri - prostrate blue violet	G4G5	S2/NA			X							DW RO
Woodwardia virginica - Virginia chain-fern	G5	S5/NA								X		SP
Xerophyllum asphodeloides - turkey beard	G3	S3/S1				X	X	X	X	X	X	DW
Zanthoxylum americanum - northern prickley ash	G5	S2S3/S4				X						SB DW
Zigadenus elegans ssp *glaucus* - white camass	G5T4?	S2/S?			X							RO DW

*likely to occur

ANIMALS

INSECTS, MILLIPEDES AND CRUSTACEANS

SCIENTIFIC NAME - COMMON NAME	RANK GLOBAL	RANK. VANHP/ WVNHP	STATUS STATE/ FEDERAL		KNOWN OCCURRENCES BY DISTRICT LOCATION(S)							HABITAT
			VA	FED	LTO*	DF	DR	JR	LE	PD	WS	
Aeshna mutata - sapphire darter	G3G4	S1/SU			X							WL RI
Bolona selene myrina - silver bordered fritillary	G5T5	SU/SU									X	WL
Calephelis borealis - northern metalmark butterfly	G3G4	S3/S3				X	X	X	X		X	SB DW
Catocala pretiosa pretiosa - precious underwing moth	G4	SH/NA		C2	X							DW
Colias interior - pink-edged sulphur	G5	S1/S3			X							DW
Erynnis persius - Persius dusky wing skipper	G4	SU/SU			X							MW WL
Erythroecia hebardi - Hebard's noctuid moth	GU	SH/NA		C2	X							MW GL
Euchlaena milnei - looper moth	GU	SH/NA		C2	X							MW
Euchloe olympia - grizzled skipper	G3	S3/S4				X	X	X	X		X	SB DW
Euphyes bimaculata - two-spotted skipper	G4	S2/SU			X							WL
Gomphus vindifrons - blue faced clubtail	G2G3	S1/SU			X							WL RI
Hydraena maureenae - Maureen's minute moss beetle	G1G3	S1S3/SU		C2	X							RI WL
Incisalia polios - hoary elfin butterfly	G5	S1/S1				X	X	X	X		X	SB DW
Lanthus parvulus - speckled trout clubtail	G3G4	S1/SU			X							WL RI
Lestes eunnus - amber-wing spreadwing damselfly	G1	S2/SU						X				MP
Nannana shenandoeasis - Shenandoah Mountain millipede	G1	S1/SU					X					MT MW
Phyciodes batesii - tawny cresent butterfly	G3G4	SH/S1		C2	X							DW
Phyciodes pascoensis - northern pearly crescent	G5	S1/S3									X	SB RI
Pseudanophthalmus avernus - Avernus cave beetle	G1	S1/NA		C2	X							CV
Pseudanophthalmus intersectus - x-roads cave beetle	G1	S1/NA		C2	X							CV
Pseudanophthalmus limicola - mud cave beetle	G1	S1/NA		C2	X							CV
Pseudanophthalmus nelsoni - Nelson's cave beetle	G1	S1/NA		C2	X							CV

*likely to occur

ANIMALS

INSECTS, MILLIPEDES AND CRUSTACEANS

SCIENTIFIC NAME - COMMON NAME	RANK· GLOBAL	RANK· VANHP/ WVNHP	STATUS STATE/ FEDERAL		KNOWN OCCURRENCES BY DISTRICT LOCATION(S)							HABITAT
			VA	FED	LTO*	DF	DR	JR	LE	PD	WS	
Pseudanophthalmus petrunkevitchi - Petrunkevitchi's cave beetle	G1	S1/NA		C2	X							CV
Pyrgus wyandot - grizzly skipper	G3Q	S3/S1			X							SB DW
Spyeria diana - Diana	G3	S3/S2			X							MW RI
Spyeria idalia - regal fritillary	G3	SH/S1		C2	X							OF
Stygobromus morrisoni - Morrison's cave amphipod	G3	S1S2/S1	SC	C2	X							CV
Stygobromus mundus - Bath County cave amphipod	G2	S1S2/S?	SC	C2	X							CV
Synanthedon castaneae - chestnut clearwing moth	GH	SX/SX		C2	X							MW DW

*likely to occur

MOLLUSKS (MUSSELS AND SNAILS)

SCIENTIFIC NAME - COMMON NAME	RANK GLOBAL	RANK: VANHP/ WVNHP	STATUS STATE/ FEDERAL		KNOWN OCCURRENCES BY DISTRICT LOCATION(S)							HABITAT
			VA	FED	LTO*	DF	DR	JR	LE	PD	WS	
Alasmidonta varicosa - brook floater	G3	S1/S2S3	E	C2				X				AQ
Elliptio lanceolata - yellow lance	G4	S2S3/NA	SC	C2				X				AQ
Fusconaia masoni - Atlantic pigtoe	G2	S2/NA	T	C2				X				AQ
Heliodiscus diadema - shaggy coil snail	G1	S1/NA	E	C2	X							RO
Lampsilis canosa - yellow lampmussel	G4	S2/S?	SC	C2				X	X			AQ
Lasmigona subviridis - green floater	G4	S2/S1	SC	C2				X	X			AQ
Pleurobema collina - James spinymussel	G1	S1/NA	E	E				X				AQ

FISH

SCIENTIFIC NAME - COMMON NAME	RANK· GLOBAL	RANK· VANHP/ WVNHP	STATUS STATE/ FEDERAL		KNOWN OCCURRENCES BY DISTRICT LOCATION(S)							HABITAT
			VA	FED	LTO*	DF	DR	JR	LE	PD	WS	
Cottus girardi - Potomac sculpin	G4	S3/S2	SC				X		X			AQ
Notropis semperasper - roughhead shiner	G3	S3/NA	SC			X		X			X	AQ
Noturus gilberti - orangefin madtom	G2	S1/NA	T	C2				X				AQ

*likely to occur

AMPHIBIANS

SCIENTIFIC NAME - COMMON NAME	RANK: GLOBAL	RANK VANHP/ WVNHP	STATUS STATE/ FEDERAL		KNOWN OCCURRENCES BY DISTRICT LOCATION(S)							HABITAT
			VA	FED	LTO*	DF	DR	JR	LE	PD	WS	
Ambystoma tigrinum tigrinum - eastern tiger salamander	G5T?	S1/NA	E							X		SP
Plethodon punctatus - Cow Knob salamander	G3	S2/S1	SC	C2			X					MW

REPTILES

SCIENTIFIC NAME - COMMON NAME	RANK GLOBAL	RANK: VANHP/ WVNHP	STATUS STATE/ FEDERAL		KNOWN OCCURRENCES BY DISTRICT LOCATION(S) OR *LIKELY TO OCCUR							HABITAT
			VA	FED	LTO*	DF	DR	JR	LE	PD	WS	
Clemmys guttata - spotted turtle	G5	S4/S1								X		SP WL
Clemmys insculpta - wood turtle	G5	S2/S3	T				X		X			WL RI
Eumeces anthracinus - coal skink	G5	S2/S2					X					SB DW
Opheodrys vernalis vernalis - smooth green snake	G5T?	S3/S4					X				X	MT GL
Pituophis melanoleucus melanoleucus - northern pine snake	G5T?	SU/SU	SC	C2					X	X		DW
Virginia valenae pulchra - mountain earth snake	G5T?	SU/S3	SC		X							MW WL

*likely to occur

BIRDS[1]

SCIENTIFIC NAME - COMMON NAME	RANK. GLOBAL	RANK VANHP/ WVNHP	STATUS STATE/ FEDERAL		KNOWN OCCURRENCES BY DISTRICT LOCATION(S)							HABITAT
			ST	US	LTO*	DF	DR	JR	LE	PD	WS	
Accipiter cooperii - Cooper's hawk	G4	S1S2/S4				X	X	X	X	X	X	MW DW
Accipiter striatus - sharp-shinned hawk	G5	S3/S4				X	X	X	X	X	X	MW DW
Aegolius acadius - northern saw-whet owl	G5	S1/S1?	SC								X	MW
Aquila chrysaetos - golden eagle	G4	SH/SU							X			RO
Ammodramus henslowii - Henslow's sparrow	G4	S1/SH	T	C2	X							WL GL
Carpodacus purpurpeus - purple finch	G5	S1/S4	SC								X	MW
Catharus guttatus - hermit thrush	G5	S1/S3S4	SC								X	MW
Contopus borealis - olive-sided flycatcher	G5	SH/S1									X	MW
Dendroica cerulea - cerulean warbler	G4	S?/SH	SC	C2							X	MW
Dendroica fusca - blackburnian warbler	G5	S2/S4					X				X	MW
Dendroica magnolia - magnolia warbler	G5	S2/S4	SC				X				X	MW
Empidonax alnorum - alder flycatcher	G5	S2/S3	SC								X	MW
Falco peregrinus - peregrine falcon	G3	S1/S1	E	E		X	X		X	X		RO
Haliaeetus leucocephalus - bald eagle	G3	S2S3/S1	E	E							X	RI
Lanius ludovicianus migrans - loggerhead shrike	G4T2	S2/S1	E	C2	X							GL OF
Loxia curvirostra - red crossbill	G5	S1/S1	SC			X	X				X	MW
Melospiza georgiana - swamp sparrow	G5	S1/S4									X	WL
Oporornis philadelphia - mourning warbler	G5	S1/S3	SC								X	WL MW
Resulus satrapa - golden-crowned kinglet	G5	S2/S4	SC				X				X	MW
Seiurus noveboracensis - northern waterthrush	G5	S1/S4									X	WL RI
Sitta canadensis - red-breasted nuthatch	G5	S2/S4	SC				X				X	MW
Sphyrapicus varius - yellow-bellied sapsucker	G5	S1/S1S2									X	MW
Thryomanes bewickii altus - Appalachian Bewick's wren	G5T?	S1/S1	E	C2	X							OF
Vermivora ruficapilla - Nashville warbler	G5	S1/S1									X	MW WL

[1]Species with known or likely nesting sites on Forest

*likely to occur

MAMMALS

SCIENTIFIC NAME - COMMON NAME	RANK. GLOBAL	RANK. VANHP/ WVNHP	STATUS STATE/ FEDERAL		KNOWN OCCURRENCES BY DISTRICT LOCATION(S)							HABITAT
			VA	FED	LTO*	DF	DR	JR	LE	PD	WS	
Condylura cristata cristata - star nosed mole	G5T5	S3/S4	SC	3C	X							GL WL
Felis concolor couguar - eastern cougar	G4TH	SX/SX	E	E	X							All habitats except aquatic
Glaucomys sabrinus fuscus - Va. n flying squirrel	G5T2	S1/S2	E	E							X	MW
Lepus americanus - snowshoe hare	G5	S1/S4	E								X	MW
Lutra canadensis lataxina - river otter	G5T4	S4/SH	SC					X				RI
Martes pennanti - fisher	G5	S1/S3									X	MW
Microsorex hoyi winnemana - southern pigmy shrew	G5T5	SU/S2S3	SC	3C			X					MW DW
Microtus chrotorrhinus carolinensis - southern rock vole	G5T3	S1/S3	E	C2							X	MW
Myotis keenii - Keen's long-eared bat	G4	S3/S2					X		X	X	X	CV
Myotis subulatus leibii - eastern small-footed bat	G3T3	S1/S2S3	SC	C2			X					CV
Myotis sodalis - Indiana bat	G2	S1/S1	E	E							X	CV
Neotoma floridana magister - eastern woodrat	G5T3	S3/S4	SC	C2		X	X	X	X	X	X	RO CV
Plecotus townsendii virginianus - Va big-eared bat	G5T2	S1/S2	E	E	X							CV
Sorex dispar - long-tailed shrew	G4	S3/S2S3	SC	C2			X					RO RW
Sorex palustris punctulatus - southern water shrew	G5T3	S1/S2	E	C2							X	MT WL
Sylvilagus transitionalis - New England cottontail	G4	S4/S3	SC	C2		X	X	X		X	X	MT GL

*likely to occur

DEFINITIONS OF ABBREVIATIONS USED

RANGER DISTRICTS
DF = DEERFIELD
DR = DRY RIVER
JR = JAMES RIVER
LE = LEE
PD = PEDLAR
WS = WARM SPRINGS

VANHP/WVNHP = VIRGINIA/WEST VIRGINIA NATURAL HERITAGE PROGRAM RANKINGS G = GLOBAL RANKING, AND S = STATE RANKING.
G1 = EXTREMELY RARE THROUGHOUT ENTIRE RANGE OF SPECIES (OCCURRENCES 1-5)
S1 = EXTREMELY RARE THROUGHOUT THE STATE (OCCURRENCES 1-5)
G2 = VERY RARE THROUGHOUT ENTIRE RANGE OF SPECIES (OCCURRENCES 6-20)
S2 = VERY RARE THROUGHOUT THE STATE (OCCURRENCES 6-20)
G3 = RARE OR UNCOMMON THROUGHOUT THE ENTIRE RANGE OF SPECIES (OCCURRENCES 21-100)
S3 = RARE OR UNCOMMON IN THE STATE (OCCURRENCES 21-100)
G4 = COMMON AND APPARENTLY SECURE THROUGHOUT RANGE
S4 = COMMON AND APPARENTLY SECURE THROUGHOUT STATE
G5 = VERY COMMON AND DEMONSTRABLY SECURE THROUGHOUT RANGE
S5 = VERY COMMON AND DEMONSTRABLY SECURE THROUGHOUT STATE
GX = BELIEVED EXTINCT WITH NO LIKELIHOOD OF REDISCOVERY
SX = BELIEVED EXTIRPATED FROM STATE
GH = HISTORICALLY KNOWN GLOBALLY, NOT RECENTLY VERIFIED (WITHIN PAST 15 YEARS)
SH = HISTORICALLY KNOWN FROM STATE, NOT RECENTLY VERIFIED (WITHIN PAST 15 YEARS)
GU = POSSIBLY RARE, STATUS UNCERTAIN, MORE DATA NEEDED
SU = POSSIBLY RARE, STATUS UNCERTAIN, MORE DATA NEEDED
Q = TAXONOMIC QUESTION
T = SIGNIFIES THE RANK OF A SUBSPECIES OR VARIETY
? = RANK UNCERTAIN
NA = NOT KNOWN TO OCCUR IN STATE

STATE STATUS (LEGAL)
E = LISTED ENDANGERED IN VIRGINIA
T = LISTED THREATENED IN VIRGINIA
SC = SPECIAL CONCERN IN VIRGINIA

FEDERAL STATUS (LEGAL)
C1 = CATEGORY 1 = CANDIDATE FOR LISTING AS THREATENED OR ENDANGERED BY THE USFWS-(ENOUGH INFORMATION AVAILABLE TO LIST AS T OR E)
C2 = CATEGORY 2 = CANDIDATE FOR LISTING AS THREATENED OR ENDANGERED BY THE USFWS-(SEEKING MORE INFORMATION ON THE SPECIES)
3C = FORMER CANDIDATE, BUT MORE COMMON THAN ORIGINALLY THOUGHT
E = LISTED ENDANGERED
T = LISTED THREATENED
PE = PROPOSED ENDANGERED
PT = PROPOSED THREATENED

HABITAT

AQ = AQUATIC
CV = CAVE

DW = DRY WOODLANDS

GL = GRASSLANDS (INCLUDES PRAIRIE-LIKE OPENINGS AND GLADES)
MP = MOUNTAIN PONDS

MT = MOUNTAIN TOP, HIGH ELEVATION AREAS
MW = MESIC WOODLANDS

OF = OLD FIELD, SHRUBBY VEGETATION

RI = RIPARIAN AREAS

RO = ROCK OUTCROPS (ACIDIC & CALCAREOUS)

SB = SHALE BARRENS
SP = SEASONALLY DRY SINKHOLE PONDS
WL = WETLANDS (INCLUDES BOGS, SEEPS, WET MEADOWS)

LEGALITIES OF RANKINGS

G and S rankings by the Natural Heritage Programs have no direct tie to a specific law governing the management of national forests. However, the system is an effective method of tracking rare species, and these rankings are often the basis for listing a species as SENSITIVE

SENSITIVE is a rank assigned by the Regional Forester. It affords protection to a species on the Forest. The Forest goal is to protect/and or/improve the species habitat to ensure that it does not need to be listed as Threatened or Endangered.

THREATENED/ENDANGERED (listing assigned by state) affords legal state protection to a species.

THREATENED/ENDANGERED (listing by USFWS) affords legal federal protection to a species.

LAWS, POLICIES, AND PROPER PROCEDURES ARE DETAILED IN FSM 2670

APPENDIX G
THE RECREATION OPPORTUNITY SPECTRUM

INTRODUCTION

The Recreation Opportunity Spectrum (ROS) offers a framework for understanding the relationships and interactions between physical settings and recreation opportunities and experiences. For example, camping in an undeveloped setting with difficult access and few, if any, facilities (semi-primitive, nonmotorized) offers a sense of solitude and challenge that is not found in a highly developed setting that contains many facilities (Rural or Urban) where security and social interaction are key characteristics.

The Forest Service Recreation Opportunity Spectrum (ROS) and the Visual Management System with Visual Quality Objectives (VQO) are indispensable tools for recreation planning. The ROS classes and VQOs are incorporated in the different management areas (and management area prescriptions) to comply with NFMA and the NFMA Regulations The NFMA Regulations contain three requirements which are being met through the use of the ROS classes, VQOs and standards designed to meet these objectives:

36 CFR 219 21(a):

"Forest planning shall identify–

[1] the physical and biological characteristics that make land suitable for recreation opportunities;

[2] The recreational preferences of user groups and the settings needed to provide quality recreation opportunities, and

[3] Recreation opportunities on the National Forest System lands.

36 CFR 219.21(f):

"The visual resource shall be inventoried and evaluated as an integrated part of evaluating alternatives in the forest planning process, addressing both the landscape's visual attractiveness and the public's visual expectation. Management prescriptions for definitive land areas of the forest shall include visual quality objectives "

36 CFR 219.27(b).

"Management prescriptions that involve vegetation manipulation for tree cover for any purpose shall–

(6) Provide the desired effects on water quantity and quality, wildlife and fish habitat, regeneration of desired tree species, forage production, recreation use, aesthetic values, and other resource yields....

36 CFR 219.27(c)(6):

"Timber harvest cuts designed to regenerate an even-aged stand of timber shall be carried out in a manner consistent with the protection of soil, watershed, fish and wildlife, recreation, and aesthetic resources, and the regeneration of the timber resource "

In the George Washington Forest Plan revision process, ROS is used to inventory existing recreation opportunities and to analyze the effects that different land allocations and their associated resource management activities will have on the existing distribution and mix of opportunities.

The ROS class distribution and associated opportunities have been tracked for each of the alternatives considered in detail in the EIS. Different land allocations and their associated activities will result in different ROS class distributions in both amount and location.

The ROS range on the George Washington National Forest includes semi-primitive nonmotorized (SPNM), semi-primitive motorized (SPM), roaded natural (RN) and rural (R). The R class is only allocated to developed recreation sites and is not further discussed in this appendix. Following are descriptions of the ROS classes found on the Forest that pertain to dispersed recreation: SPNM, SPM and RN Subheadings under the ROS class describe different aspects of recreation experiences associated with each class. These sub-headings are Access, Remoteness, Social Encounters, Visitor Management, Facilities and Site Management, and Naturalness·

Access includes the type and mode of travel permissible in each ROS class. Highly developed access generally reduces the opportunities for solitude, risk and challenge. However it can enhance feelings of safety and comfort and provide increased opportunities for social interaction. Difficulty and challenge increase as one moves from the rural end of the spectrum to the primitive areas.

Remoteness refers to the extent to which individuals perceive themselves as being removed from the sights and sounds of human activity. While some visitors prefer solitude and the opportunity to test their independence, others enjoy more highly developed recreation opportunities with the comforts and conveniences which come with them.

Social Encounters refers to the number and type of other recreationists met along travelways, or camped within sight or sound of each other. This loosely measures the extent to which visitors experience either solitude or social interaction.

Visitor Management includes the degree to which visitors are regulated and controlled as well as the level of information and services provided for visitor benefit and enjoyment. In some instances people are looking for the security and safety associated with an organized, controlled recreation site. In other situations on-site controls would detract from a desired experience such as self-reliance and risk-taking. Also the type and level of information dissemination affects the recreation experience. On-site directional or interpretive signage may adversely affect the visitor who is seeking to discover and explore on his or her own initiative. On the other hand directional and interpretive signage might benefit and enhance the visitors' experience at a more developed recreation area.

Facilities and Site Management refers to the level of site development in a given area. A lack of facilities and site modifications can enhance feelings of self-reliance and independence, and

maintain the level of naturalness of the setting. Highly developed facilities can add feelings of comfort and convenience, and increase opportunities for socializing.

Naturalness is the degree to which visitors experience the natural environment without evidence of human manipulation. This indicator is portrayed by using a compatible visual quality objective (VQO) for each setting.

PRIMITIVE AND SEMI-PRIMITIVE NONMOTORIZED ROS CLASS

One recurring issue in the revision of the Forest Plan has been the absence of primitive ROS lands that are managed to provide only the most primitive recreation experience, where solitude and challenge are prevalent and where management controls are absent or minimal. Another concern that the public has voiced centers around the relatively small amount of land classified as semi-primitive, nonmotorized (SPNM). Presently, only about 15 percent of the forest is classified as SPNM. The remainder is classified as either SPM, RN or R.

Because of the distance from roads criteria used to define primitive ROS class lands (greater than 3 miles from motorized travelways), and acreage requirements (>5,000 acres), there are no areas on the Forest that qualify for this classification. This includes land within the existing wildernesses on the Forest, the cores of which are classified as SPNM.

To respond to the issue of providing a primitive setting and recreation experience, wilderness core areas and other SPNM areas outside of wilderness can be managed as if they were classified as primitive. The visual quality objective of preservation is assigned to those areas that are managed to retain as primitive a recreation opportunity spectrum as possible. The retention visual quality objective is assigned to other SPNM areas where some "light-on-the-land" management practices, such as prescribed burning, can be employed. The number of acres classified as SPNM is identified in Chapter 3 for each of the alternatives considered in detail.

Some of the recreation activities which can be expected to occur in these areas are hiking, tent camping, wildlife viewing, scenery viewing, mountain climbing, cross country skiing, horseback riding, canoeing, fishing, hunting and swimming. Visitors expect a high degree of solitude as well as opportunities for challenge and risk-taking. Benefits include increasing self-reliance, independence and improving back-country skills.

Access: No roads or public motorized trails are allowed; only nonmotorized access is permitted. Access to these areas is difficult thereby increasing opportunities for solitude, risk and challenge.

Remoteness: Visitors feel that they are removed or at least distanced from the sights and sounds of human activity. They are more than 1/2-mile from any motorized travelway.

Social Encounters: Six or fewer parties are typically encountered in a day. Visitors experience solitude and serenity with few if any opportunities for social interaction.

Visitor Management: No on-site visitor controls are present and the information dissemination facilities are very limited and subtle. Visitors rely on their own knowledge, and the opportunities for self-discovery, challenge and risk are high.

Facilities and Site Management: No facilities are provided for the comfort and convenience of the user. Facilities are only provided for the safety of the user and/or to prevent unacceptable and/or irreversible damage to the resource. All facilities are constructed out of natural undimensioned materials. A lack of facilities is consistent with visitors expectations for a "primitive", natural experience.

Naturalness: These lands provide a high degree of naturalness with little or no evidence of human-made changes to the environment. The VQO for the area is preservation or retention.

SEMI-PRIMITIVE MOTORIZED ROS CLASS

The ROS classes cover broad categories of activities and situations and need to be flexible to maintain national consistency while meeting local needs and situations The ID Team worked with the Regional Recreation Staff Unit to identify two sub-classes of SPM ROS The two subclasses of SPM ROS provide a crosswalk between motorized recreation use, wildlife management and other concerns. Timber harvesting and road construction associated with traditional wildlife management is inconsistent with the SPNM ROS class but is consistent with the SPM ROS class. At the same time, wildlife management often requires some degree of limitation of motorized access if optimum populations of species are to be achieved. Each subclass is still broad in application but at least provides some idea of the relative abundance of motorized recreation.

Semi-primitive Motorized (Subclass 2)

Semi-primitive motorized (subclass 2) or SPM2 represents situations where the Forest will be managed to provide vegetation cover and settings in the semi-primitive motorized ROS class, but motorized access by the public will be highly restricted or even non-existent. SPM2 is applied in those situations where motorized recreation is largely inconsistent with the objectives of a given management area SPM2 approximates the types of recreation opportunities afforded in SPNM but in a different setting where existing roads are maintained and infrequently used for administrative purposes. There could be some visual evidence of vegetation manipulation on lands suitable for timber production. Roads may be built into this area, but these roads are not available for public motorized use

Some of the recreational activities which can be expected to occur on SPM2 lands include hiking, walking, tent camping, mountain biking, wildlife viewing, nature study, viewing scenery, hunting, swimming, fishing, canoeing, mountain climbing, cross country skiing and horseback riding. Within the SPM2 settings there are ample opportunities to practice wildland skills and to achieve feelings of self-reliance.

Access: Motorized access by the public is highly restricted or nonexistent. Roads are generally closed to public use but are maintained and infrequently used for administrative purposes. Public access is primarily by foot, thereby providing a degree of challenge, risk and self-reliance.

Remoteness: The area has high probability of isolation from sights of human activities though an occasional primitive road, power line, or evidence of vegetation manipulation may be seen. Visitors perceive themselves as removed from human activity and experience feelings of solitude and serenity, but occasional distant sounds may be heard. SPM2 lands are more than 1/2-hour walk from any better-than-primitive roads.

Social Encounters: Because there is some challenge to accessing SPM2 areas, the likelihood for meeting other recreationists is low. Generally less than 15 other parties are encountered per day, and less than six people are present at each campsite.

Visitor Management: Subtle on-site regimentation and controls exist. Visitors may see gated roads or tank traps to regulate access into an area. Visitor information facilities are very limited and blend well with the natural environment.

Facilities and Site Management: Rustic and rudimentary facilities may be present for the purpose of site protection. Natural materials are used which blend well with the environment

Naturalness: The settings in SPM2 areas can have a high degree of naturalness These areas are managed with a visual quality objective of partial retention or retention. There may be some vegetation manipulation on lands suitable for timber production.

Semi-primitive Motorized (Subclass 1)

Semi-primitive Motorized (Subclass 1) or SPM1 represents situations where the Forest will be managed to provide motorized recreation, vegetation cover and settings in the semi-primitive motorized ROS class. Motorized access by the public may be restricted. Roads may be open year-round, open seasonally or closed year-round depending on site-specific considerations. Selected system roads are open for motorized recreation use unless unacceptable resource damage occurs or the roads are impassble because of weather or other conditions SPM1 is applied to management areas where public motorized access is emphasized or compatible with the objectives of the management area.

Some of the recreational activities which can be expected to occur on these lands include all of those listed in SPM2 plus limited motorized uses. Opportunities for solitude are less than with SPM2 or SPNM. There is a degree of challenge and risk-taking which can be experienced in some of the recreational activities associated with SPM1

Access: Motorized use is allowed on motorized trails and most primitive roads in SPM1 areas Opportunities for developing self-reliance on driving skills may be experienced on the most primitive roads and trails.

Remoteness: The area has moderate probability of isolation from sights and sounds of human activity SPM1 areas are more than 1/2-hour walk from any better-than-primitive roads. Visitors may experience short-term feelings of solitude, but occasionally nearby and distant sounds may be heard.

Social Encounters: Visitors may encounter from 6 to 15 other parties per day and generally 6 or less people are present at each campsite.

Visitor Management: Subtle on-site regimentation and controls exist. Visitor information facilities are very limited and harmonize with the natural environment.

Facilities and Site Management: Rustic and rudimentary facilities may be present for the purpose of site protection. Only natural materials which blend with the environment are used.

Naturalness: The settings in SPM1 areas can have a high degree of naturalness. These areas are managed with a visual quality objective of partial retention or retention. There may be vegetation manipulation on lands suitable for timber production.

ROADED ROS CLASS

For planning purposes, the Roaded ROS class is also divided into two subclasses. The roaded natural and roaded modified subclasses have been created to respond to public concerns that a single ROS classification of Roaded is not sufficient to protect the visual and natural resources in some situations.

Two subclasses are used: Roaded Natural (RN) and Roaded Modified (RM) These two subclasses are differentiated or defined by the visual quality objectives (VQO). RN areas are managed to meet a VQO of preservation, retention, or partial retention. RM areas are managed to meet a VQO of modification This breakdown of the Roaded ROS class allows the RN to be managed to preserve their natural qualities while the RM areas can be managed for a variety of uses.

Some of the recreational activities which occur in RN and RM areas include driving for pleasure, camping, picnicking, viewing scenery, wildlife viewing, nature study, walking, horseback riding, mountain climbing, canoeing, sailing, power boating and interpretation of resources.

Roaded Natural

Access: Full access is provided, primarily by Traffic Service Level B and C roads The challenge and risk level is low. The comfort and security level is high.

Remoteness: The area is not remote. The level of remoteness is low and has little relevance in this setting. Visitors will not experience feelings of solitude.

Social Encounters: Opportunities to encounter other recreationists is moderate to high on roads and moderate to low on trails and around developed recreation sites.

Visitor Management: There are noticeable on-site regimentation and controls, however these harmonize with the natural environment. Information facilities may be present for the enhancement of the visitors' recreational experience or the protection of the site and resources.

Facilities and Site Management: Rustic facilities may be present for the purpose of user comfort or the protection of the site. These facilities are constructed primarily of native materials with refinement of design. As a rule synthetic materials are not evident.

Naturalness: The RN areas are managed to meet a VQO of preservation, retention or partial retention. There is ample evidence of rustic structures, managerial controls, and vegetation manipluation.

Roaded Modified

Access: Access to RM areas is provided without difficulty or challenge. Visitors do not experience feelings of risk. Opportunity for social interaction is high, as is the comfort level.

Remoteness: The area is not remote. The level of remoteness is low and has little relevance in this setting. Visitors will not experience feelings of solitude.

Social Encounters: The opportunity for encountering other recreationists is moderate to high on roads and moderate to low on trails and in and around recreation areas.

Visitor Management: There are noticeable on-site regimentation and controls, however these harmonize with the natural environment. Information facilities may be present for the enhancement of the visitors' recreational experience or the protection of the site and resources.

Facilities and Site Management: Rustic facilities may be present which provide some user comfort as well as site protection. They are constructed of native materials with refinement of design As a rule any synthetic materials are not visually evident.

Naturalness: The RM areas are managed to meet a VQO of modification. The area provides the greatest evidence of vegetation manipulation.

RELATIONSHIP TO MANAGEMENT AREAS AND MANAGEMENT AREA PRESCRIPTIONS

The revision of the Forest Plan explores the use of "adopted" ROS classes and VQOs in Alternatives 3, 4, 5, 6, 7, 8, 8A, 9, 10, 11, 12, 13 and 14. Alternative 2 does not use adopted ROS classes or VQOs, so its allocation is the existing inventories. In the case of the ROS classes, each management area prescription (described in Appendix B) has an assigned ROS class based on the objectives of the management area prescription and the capability of the Forest to be managed for that ROS class In particular, the SPNM, SPM1 and SPM2 classes can only be applied to lands that are at least 2,500 acres in size and at least 1/2 mile from "other than primitive" roads. Areas smaller than 2,500 acres are permissable if contiguous to a more primitive class or because of the area's unique designation such as with a Research Natural Area. Areas smaller than 2,500 acres are permissible if contiguous to a more primitive class or because of the area's unique designation such as with a Research Natural Area. Additionally, a compatible VQO must be assigned to each ROS class. Table G-1 displays the ROS classes and the compatible VQOs.

TABLE G-1.
VISUAL QUALITY OBJECTIVES THAT ARE COMPATIBLE WITH DIFFERENT RECREATION OPPORTUNITY SPECTRUM CLASSES.

ROS Class	Compatible VQOs
SPMN	Retention or Preservation
SPM1	Partial Retention or Retention
SPM2	Partial Retention or Retention
RN	Partial Retention, Retention or Preservation
RM	Modification

Table G-2 displays how the adopted ROS classes and VQOs are applied to the existing inventories for each management area prescription. Because the two SPM subclasses have to be based on site-specific circumstances, these acreages were not broken out for each alternative. Each alternative (if selected) would have to go through a mapping exercise to further refine the areas for these two SPM subclasses. The preferred alternative went through this further refinement or ground truthing exercise. More information on adopted ROS for the preferred alternative can be found in Appendix I of the Revised Forest Plan The adopted ROS will be monitored to see if the criteria for each class are being or will be achieved

TABLE G-2.
ADOPTED RECREATION QUALITY SPECTRUM CLASSES (WITH ADOPTED VISUAL QUALITY OBJECTIVES LISTED AS FOOTNOTES)

	Existing ROS Classification		
Management Area	RN	SPM	SPNM
	---------- Adopted ROS Classification ----------		
1A	RN[2]	SPM1[2]	SPNM[2]
1B	RN[1]	SPNM[1]	SPNM[1]
2A	RN[2]	SPNM[2]	SPNM[2]
2B	SPNM[1]	SPNM[1]	SPNM[1]
3	RN[2]	SPM1[2]	SPNM[2]
4 (A[7], B, C & E)	RN[2]	SPM1[2]	SPNM[2]
4D	RN[2]	SPM1[2]	SPNM[2]
5 (A & B)	RN[2]	SPNM[2]	SPNM[2]
5C	RN[1]	N/A	N/A
5D	RN[2]	SPM2[2]	SPNM[2]
6 (A & C)	RN[2]	SPM2[2]	SPNM[2]
6B	RN[1]	SPNM[1]	SPNM[1]
7A	RN[2]	SPM1[2]	SPM1[2]
7B	RN[3]	SPM1[3]	SPM1[3]
7C	RN[2]	SPM1[2]	SPNM[2]
7D	RN[3]	SPM1[3]	SPNM[2]
7E	RN[2]	SPM1[2]	SPNM[2]
7F	RN[3]	SPM1[3]	SPM1[3]
8	RN[1]	SPNM[1]	SPNM[1]
9A	RN[1]	SPNM[1]	SPNM[1]
9B[6]	RN[2]	SPM1[2]	SPNM[2]
9C	RN[2]	SPNM[2]	SPNM[2]

[1]Preservation visual quality objective.
[2]Retention visual quality objective
[3]Partial retention visual quality objective.
[4]Modification visual quality objective.
[5]Includes OHV routes.
[6]Developed recreation sites are either roaded natural or rural depending on the degree of development.
[7]Adopted ROS for biological areas may be any combination of RN, SPM1, SPM2, or SPNM, depending on each area's site-specific location.
[8]SPM2 subclass designation may be adopted, depending on site-specific location, when applied to the following Roadless Areas: Southern Massanutten, Northern Massanutten, Crawford Mountain, and Mill Mountain.

Management Area	Existing ROS Classification RN	SPM	SPNM
	---------- Adopted ROS Classification ----------		
10A	RN[2]	SPM1[2]	SPM1[2]
10B	RN[3]	SPM1[3]	SPM1[3]
10C	RN[2]	SPM1[2]	SPNM[2]
10D	RN[3]	SPM1[3]	SPNM[2]
11 (A, B & C)[5]	RN[3]	RN[3]	SPM1[3]
11 (D & F)	RN[2]	SPM1[2]	SPM1[2]
11 (E & G)	RM[4]	RM[4]	RM[4]
12[6]	N/A	N/A	N/A
13 (A[9] & B)	RN[2]	SPM1[2]	SPNM[2]
13C	RN[2]	SPM1[2]	SPNM[2]
13D	RN[1]	SPNM[1]	SPNM[1]
14 (except E)	RN[3]	SPM2[3]	SPM2[3]
15 (except E)[10]	RN[3]	SPM1[3]	SPM1[3]
16 (except C)	RN[3]	SPM1[3]	SPM1[3]
17 (A, D & G)	RN[2]	SPM1[2]	SPM1[2]
17 (B, C, E & H)	RM[4]	RM[4]	RM[4]
17 (F & I)	RN[3]	SPM1[3]	SPM1[3]
18 (A & B)	RN[2]	SPM1[2]	SPNM[2]
18 (C & D)	RN[2]	SPM1[2]	SPM1[2]
19 (A & B)	RN[2]	SPM1[2]	SPNM[2]
19 (C & D)	RN[2]	SPNM[2]	SPNM[2]
20 (A & D)	N/A	N/A	N/A
20 (B & C)	RM[4]	RM[4]	RM[4]
20 (E & F)	RN[2]	SPNM[2]	SPNM[2]
21A (Big Schloss)	RN[2]	SPM1[2],SPM2[2]	SPNM[2]
21B (Laurel Fork)	RN[2]	SPM2[2]	SPNM[2]
21C (Little River)	RN[2]	SPM2[2]	SPNM[2]
21D (Mt. Pleasant)	RN[2]	SPNM[2]	SPNM[2]
22	RN[3]	RN[3]	SPM1[3]

[9]SPM2 subclass designation may be adopted, depending on site-specific location, when applied to Elizabeth Furnace and Shoe Creek.

[10]SPM2 subclass designation may be adopted, depending on site-specific location.

APPENDIX H
OLD GROWTH

The Forest Service has developed a national generic definition and description of old growth forests which include the following items:

> Old growth forests are ecosystems distinguished by old trees and related structural attributes. Old growth encompasses the later stages of stand development that typically differ from earlier stages in a variety of characteristics that may include tree size, accumulation of large dead woody material, number of canopy layers, species composition, and ecosystem function.
>
> The age at which old growth develops and the specific structural attributes that characterize old growth will vary widely according to forest type with climate, site conditions, and disturbance regime. For example, old growth in fire-dependent forest types may not differ greatly from younger forests in the number of canopy layers or accumulation of downed woody material.
>
> Old growth is typically distinguished from younger growth by the following structural attributes and characteristics:
>
> 1. Large trees for that species and site.
> 2. Uneven age structure with tree species in several size classes resulting in multiple canopy layers.
> 3. Accumulations of large-size dead standing and fallen trees that are high relative to earlier stages and in all stages of decay
> 4. Broken or deformed tops or bole and root decay primarily resulting from weather phenomena such as ice or wind storms.
> 5. Single or multiple tree-fall gaps usually resulting from windthrow and resulting in understory patchiness and increased micro-topography relief
> 6. Undisturbed soils and soil macropores usually with a well developed surface organic layer (O horizon)
> 7. On mesic sites a well developed fungal component
>
> Forest Service Region 8 and Region 9 along with The Nature Conservancy are in the process of developing definitions for old growth forest types in the Eastern United States. A total of 35 old growth type groups have been identified as occurring in Region 8 and Region 9
>
> Factors used to define old growth forest type groups are those that most strongly influence the structural and functional characteristics of old growth forests. These include site factors that directly or indirectly affect productivity and spacing of trees, disturbance regimes, physiognomy, dominant tree species, and geography (in that geography is related to climate, which controls productivity, in part).
>
> Narrative descriptions have been developed for each of the 35 type groups to aid in the writing of specific definitions. These narratives tend to be general in scope and cover only the most pertinent ecological concepts.
>
> The following 10 narrative descriptions are for those old growth forest type groups known to occur on the George Washington National Forest and are from the Final Draft of Narrative Descriptions of

35 Old Growth Forest Type Groups prepared for USDA Forest Service Regions 8 and 9 by Greg Nowacki of The Nature Conservancy and dated September 25, 1992.

For each old growth forest type, minumum ages are determined at which a stand will begin to develop attributes characteristic of old growth conditions. It has been stated that a given old growth forest type will begin to develop old growth characteristics at an age approximately one-half the maximum longevity (lifespan) of the dominate tree(s) in that type *Maine Critical Areas Program, 1983*. The old growth forest types which occur on the Forest are therefore divided into three groups as to when they begin to develop old growth characteristics. These groups not only reflect the longevity of dominate trees, but natural disturbance regimes (fire, ice storms, gap formation, etc.) and edaphic conditions (rainfall, slope, aspect, etc.). The ages are determined to be: 1) yellow pine dominated and other xeric or frequently disturbed types - 80 years, 2) dry to mesic oak types - 130 years, and 3) mixed mesophytic and conifer/northern hardwood types - 180 years. These ages and groupings were discussed with and confirmed by Greg Nowacki, Old Growth Forest Ecologist with The Nature Conservancy.

Table H-1 displays types and acres known to occur on the Forest and these acres tentatively known to now exist in an old growth condition.

Table H-1.
Acres on Forest by CISC Forest type, Forest Type Group (All Ages), Present Tentative Old Growth Inventory, and Minimum Stand Age for *Old Growth*

Old Growth Forest Type Group with R8 CISC Forest Type which compose the Type Group and (acres, all ages) on George Washington National Forest		Total Acres on Forest by OG Type Group All Ages	Tentative Acres in Present Old Growth Inventory	Minimum Stand Age for OG Characteristics*
1	Northern hardwood forests 81 - Sugar Maple - Beech - Yellow Birch (9378)	9378	349	180
2	Conifer-northern hardwoods forests:			
	a hemlock-northern hardwood subgroup 5 - Hemlock (1155) 8 - Hemlock-Hardwood (5702)	6857	1960	180
	b white pine-northern hardwood subgroup 3 - White Pine (23293) 4 - White Pine-Hemlock (2239) 9 - White pine-cove hardwood (1694) 10 - White Pine-Upland Hardwood (10716)	37942	1968	180
	c spruce-northern hardwood subgroup 6 - Fraser Fir(?) (58) 7 - Red Spruce-Fraser Fir(?) (365) 17 - Red Spruce-Northern Hardwoods (9)	432	375	180
5	Mixed mesophytic forests 41 - Cove Hardwood-White Pine-Hemlock (6065) 50 - Yellow Poplar (4524) 56 - Yellow Poplar-White Oak-Red Oak (40506)	51095	3425	180
10	Hardwood wetland forests 71 - Black Ash-American Elm-Red Maple (61)	61	**	80
21	Dry-mesic oak forests 52 - Chestnut Oak (218610) 53 - White Oak-Red Oak-Hickory (332105) 54 - White Oak (6864) 55 - Northern Red Oak (15318) 59 - Scarlet Oak (39546) 60 - Chestnut Oak-Scarlet Oak (65515)	677958	87889	130
22	Dry and xeric oak woodlands & savannas 51 - Post Oak-Black Oak (597)	597	575	130

Old Growth Forest Type Group with R8 CISC Forest Type which compose the Type Group and (acres, all ages) on George Washington National Forest		Total Acres on Forest by OG Type Group All Ages	Tentative Acres in Present Old Growth Inventory	Minimum Stand Age for OG Characteristics*
24	Xeric pine & pine-oak forests & woodlands 12 - Shortleaf Pine-Oak (1050) 15 - Pitch Pine-Oak (31871) 16 - Virginia pine - oak (18706) 20 - Table Mt Pine-Hardwood (15129) 32 - Shortleaf Pine (1590) 33 - Virginia pine (14408) 38 - Pitch Pine (28084) 39 - Table Mt. Pine (13650) 49 - Bear Oak-Scrub Oaks-Yellow Pine (939) 57 - Scrub Oak (346)	125773	78178	80
25	Dry & dry-mesic oak-pine forests 42 - Upland Hardwood-White Pine (16683) 45 - Chestnut Oak-Scarlet Oak-Yellow Pine (82563) 47 - White Oak-Black Oak-Yellow Pine (1667) 48 - Northern Red Oak-Hickory-Yellow Pine (21588)	122501	4441	130
28	Eastern riverfront forests 72 - River Birch-Sycamore (210) 73 - Cottonwood (6)	216	206	80
37	Rocky, thin-soiled excessively drained conifer woodlands 35 - Eastern Red Cedar (11)	11	**	80
	Total	1032821	179677	

*These ages are tentative pending publication of type definitions
** Type exists on Forest but no old growth acres are identified in present inventory

Old Growth Forest Type # and name.

01. NORTHERN HARDWOOD FORESTS

SAF Forest Cover Types:
- 25 - sugar maple-beech-yellow birch
- 27 - sugar maple
- 28 - black cherry-maple
- 60 - beech-sugar maple

R8 CISC Forest Type represented on GWNF.
- 81 - sugar maple-beech-yellow birch

Physiographic Provinces (after Fenneman 1938):
Blue Ridge (all sections), Ridge and Valley (all sections), Appalachian Plateaus (all sections), New England (all sections), Adirondack, Central Lowland (Great Lake, Driftless, and Western Young Drift sections), and Superior Upland

Tentative approximate minimum stand age at which old growth characteristics begin development. 180 years

Narrative Description:

Northern hardwood forests occur exclusively in the northern tier of states in the East, except for a southern extension along the Appalachian Mountains (Bormann and Likens 1979). The distribution of yellow birch (*Betula alleghaniensis* Britton) essentially demarcates the southern boundary of this forest type group, which extends from northwest Minnesota to western Pennsylvania, then loops southward encompassing most of the Appalachian Mountains before ending in northern New Jersey. In the North, these forests generally occur on well- to moderately well-drained sites, and are best developed on fertile, mesic Alfisols at low to middle elevations. In the middle and southern Appalachians, northern hardwoods are restricted to higher elevations that possess cool, mesic conditions. These conditions are most prevalent on north- and east-facing slopes where direct radiation and evapotranspiration rates are reduced These forests are poorly developed in certain parts of the middle Appalachians where the mountains are relatively low (e.g. Ridge and Valley Province)

Sugar maple (*Acer saccharum*), beech (*Fagus grandifolia*) and yellow birch are the dominant northern hardwood species. Deciduous associates include American basswood (*Tilia americana*), white ash (*Fraxinus americana*), red maple (*A. rubrum*), black cherry (*Prunus serotina*), northern red oak (*Quercus rubra*) and yellow poplar (*Liriodendron tulipifera*). Elm (*Ulmus*) species were formerly important in these forests, however, Dutch elm disease has sharply diminished their occurrence in the overstory. Hemlock (*Tsuga canadensis*), eastern white pine (*Pinus strobus*) and red spruce (*Picea rubens*) are frequent associates; however, their combined overstory coverage along with other conifers is less than 25 percent (cf. OGFT02. Conifer-northern hardwood forests). Canopy gaps formed by single or multiple tree falls are common (Canham 1985). Under steady-state conditions, microcyclic succession among dominant species may

occur (Forcier 1975). Because moist conditions generally prevail, fires are infrequent and usually limited to small surface burns. Disturbance events, such as ice and wind storms, are periodic in occurrence and range in intensity from complete destruction to less than 10 percnet canopy removal (Frelich and Lorimer 1991).

Rarely do disturbances significantly alter species composition; normally they just set back stand stature. Where their distributions overlap (i.e. in the middle and southern Appalachians), northern hardwood forests are distinguished from mixed mesophytic forests (OGFT05a) by 1) occurring only on high elevation slopes and ridgetops, 2) having lower tree species richness and diversity (relative to mixed mesophytic forests), and 3) the presence of northern plant species (e.g. yellow birch, red spruce).

Old Growth Forest Type # and name:

02. CONIFER - NORTHERN HARDWOOD FORESTS

SAF Forest Cover Types:

20 - white pine-northern red oak-red maple
21 - eastern white pine (in part)
22 - white pine-hemlock
23 - eastern hemlock
24 - hemlock-yellow birch
30 - red spruce-yellow birch
31 - red spruce-sugar maple-beech
35 - paper birch-red spruce-balsam fir (in part)

Physiographic Provinces (after Fenneman 1938):

Piedmont (Lowland section), Blue Ridge (all sections), Ridge and Valley (all sections), Appalachian Plateaus (all sections), New England (all sections), Adirondack, Central Lowland (Great Lake, Driftless, and Western Young Drift sections), and Superior Upland.

Tentative approximate minimum stand age at which old growth characteristics begin development: 180 years

Narrative Description:

The distribution of conifer-northern hardwood forests across the landscape is similar to that of northern hardwoods (OGFT01), covering the northern tier of states from Minnesota to Maine and extending southward along the Appalachian Mountains to north Georgia. In the North, conifer-northern hardwoods typically exist on Alfisols, Inceptisols or Spodosols ranging from dry mesic to wet mesic. Soil nutrient availability plays a major role in determining the relative competitiveness of conifers and hardwoods. In general, conifers are more successful on nutrient poor sites and hardwoods on nutrient rich sites. Hence, conifer-hardwood mixtures usually develop best on sites that are intermediate in fertility (i.e. sites conveying no distinct competitive advantage toward either tree group). The cooler temperatures required to support species characteristic of this forest type group, in turn, restrict these forests to progressively higher elevations when moving south along the Appalachian Chain. In the southern Appalachians, cooler site conditions are found primarily on north- and east-facing slopes. The preferential removal of certain conifers (i.e. eastern white pine and hemlock) and changes in the disturbance regime by Europeans have reduced the present-day occurrence of this forest type group in many locations (Elliott 1953, Goodlett 1954, Whitney 1990).

As the name implies, these forests are comprised of various mixtures of coniferous and broadleaf trees, of which, at least 25 percent of the overstory canopy is comprised of either tree group. This broad forest type group can be divided into three subgroups based on the dominant conifer as follows:

a) hemlock-northern hardwoods subgroup

R8 CISC Forest Types represented on GWNF:
5 - hemlock
8 - hemlock-hardwood

Hemlock (*Tsuga canadensis*) is considered a wet-mesic species, developing best on cool, moderately well- to somewhat poorly-drained sites.

Soils typically have more surfaces consisting largely of needles and twigs. Acids released by decomposing coniferous debris on the surface aid in soil podsolization; in turn, many soils are Spodosols or Inceptisols with spodic tendencies. Main associates are yellow birch (*Betula alleghaniensis*), sugar maple (*A. saccharum*), beech (*Fagus grandifolia*), red maple (*Acer rubrum*) and eastern white pine (*Pinus strobus*). Because of its dense foliage, hemlock greatly limits light penetration to the forest floor. In turn, understory vegetation varies greatly corresponding closely with overstory conditions; being sparse beneath hemlocks, common beneath hardwoods and abundant within canopy gaps.

Some hemlock-northern hardwood forests are found in depressions or seepage areas that receive groundwater discharge, frequently occurring along swamp margins. The fertility of these wet areas is variable, depending largely on the mineral concentration of groundwater inflow. Flooding is common, particularly during and immediately after winter snow melt. Yellow birch and red maple are most common associates of hemlock on wetter areas, however, many trees tolerant of wet conditions may occur, including balsam fir (*Abies balsamea*), paper birch (*B papyrifera*), black spruce (*Picea mariana*), black ash (*Fraxinus nigra*), elm (*Ulmus*) and northern white cedar (*Thuja occidentalis*).

Windthrow is particularly common where high water tables limit downward expansion of tree roots, creating dynamic stand conditions. This disturbance allows for frequent gap phase regeneration, and windthrown trees provide medium for hemlock and yellow birch regeneration. In turn, pit-and-mound microtopography is characteristic of hemlock-northern hardwood forests. Because of prevailing moist conditions, fire has historically had considerably less impact on the ecology of these forests relative to storm events.

b) eastern white pine-northern hardwood subgroup

R8 CISC Forest Types represented on GWNF:
3 - white pine
4 - white pine-hemlock
9 - white pine-cove hardwood
10 - white pine-upland hardwood

The distribution of eastern white pine-northern hardwoods is closely related to historical fire patterns, largely comprising the drier end of the conifer- northern hardwood complex (i.e. occupying sites more conducive to burn). However, eastern white pine-northern hardwood mixtures on moist sites do occur. Common associates include red maple, paper birch and northern red oak (*Quercus rubra*) on drier sites and sugar maple, beech, yellow birch, white ash

(*F. americana*) and hemlock on moister sites. Soils are coarse- to medium-textured Fire, along with other disturbances, plays a central role in maintaining eastern white pine in these forests by providing conditions that encourage pine regeneration (e g. reducing hardwood competition, exposing mineral soil, increasing forest floor light levels, etc.). Indeed, most of the impressive eastern white pine-northern hardwood forests present before European settlement resulted from large-scale fires centuries before (Upper Great Lakes Graham 1941, Maissurow 1941; Northeast: Cline and Spur 1942, Hough and Forbes 1943).

c) *red spruce-northern hardwood subgroup*

R8 CISC Forest Types represented on GWNF:
- 6 - Fraser fir (?)
- 7 - red spruce-Fraser fir (?)
- 17 - red spruce-northern hardwoods

This mixture is representative of cool microsites, and occurs only in those states along the Appalachian Chain from Maine to North Carolina. In New England, red spruce-northern hardwoods can be found in a variety of topographic locations, however, they most frequently occur at mid-elevations where montane spruce and northern hardwood forests intergrade (Bormann et al 1970, Cogbill and White 1991). This zone of intergradation is restricted progressively to higher elevations when moving south along the Appalachians according to regional changes in temperature In the southern Appalachians, many red spruce-northern hardwoods occur only on mountaintops. Since this mixture is prevalanet in mountainous terrain, sites are normally quite steep, and soils shallow and rocky. Common associates vary considerably among locations, and include yellow birch, sugar maple, beech, red maple, eastern white pine, balsam fir, sweet birch (*Betula lenta*) and paper birch Insect outbreaks, wind and ice storms, and fire are common disturbances in red spruce-northern hardwoods.

05. MIXED MESOPHYTIC AND WESTERN MESOPHYTIC FORESTS

SAF Forest Cover Types·
- 25 - sugar maple-beech-yellow birch (in part)
- 27 - sugar maple
- 52 - white oak-black oak-northern red oak
- 57 - yellow poplar
- 58 - yellow poplar-eastern hemlock
- 59 - yellow poplar-white oak-northern red oak
- 60 - beech-sugar maple

R8 CISC Forest Type represented on GWNF.
- 41 - cover hardwood-white pine-hemlock

50 - yellow poplar
56 - yellow poplar-white oak-red oak

Physiographic Provinces (after Fenneman 1938).
Coastal Plain (northern portions of East Gulf and Mississippi Alluvial sections), Blue Ridge (all sections), Ridge and Valley (Middle and Southern sections), Appalachian Plateaus (Allegheny Mountain, Unglaciated Allegheny Plateau, Cumberland Mountains and Plateau sections), Interior Low Plateau (all sections), Central Lowland (Till Plains and Dissected Till Plains sections), Ozark Plateaus (all sections) and Ouachita (all sections).

Tentative approximate minimum stand age at which old growth characteristics begin development: 180 years

Narrative Description.

Collectively, mixed mesophytic and western mesophytic forests cover parts of the central and southern Appalachians and extend westward to the Ozark and Ouachita Mountains. In the mountains, these forests are usually restricted to mountain coves and north and east aspects of lower slopes (sites of increased moisture and reduced evapotranspiration) On gently rolling terrain, these forests may cover the entire landscape if site conditions are adequate. Since mixed mesophytic and western mesophytic forests differ considerably regarding species richness, they can be separated into subgroups.

Mixed mesophytic forests are located primarily in the Appalachian Plateaus, Ridge and Valley, and Blue Ridge Physiographic Provinces, and are indicative of rich, mesic sites These forests are considered the most diverse communities in the Eastern Deciduous Forest (Braun 1950). The overstory is normally comprised of a number of tree species, usually with no one species dominating (Martin 1992). Tree species include sugar maple (*Acer saccharum*), yellow poplar (*Liriodendron tulipifera*), beech (*Fagus grandifolia*), hemlock (*Tsuga canadensis*), northern red oak (*Quercus rubra*), chestnut oak (*Q. prinus*), white oak (*Q. alba*), yellow buckeye (*Aesculus octandra*) and white basswood (*Tilia heterophylla*). The latter two species are unique to mixed mesophytic forests, and can be considered diagnostic of this subgroup (Martin 1992). In essence, mixed mesophytic forests represent a transition between dry oak-hickory and mesic beech-maple forests, having characteristics of both (Sampson 1930) Mixed mesophytic forests are generally considered to be late seral, stable communities, however successional forests of yellow poplar and/or oak do exist, particularly after major disturbances. At later stages, mixed mesophytic forests exhibit a high degree of structural and compositional complexity, and forest dynamics are largely driven by small-scale disturbances (single tree gaps).

10. HARDWOOD (elm-ash-maple) WETLAND FORESTS

SAF Forest Cover Types:
39 - black ash-American elm-red maple
65 - pin oak-sweetgum (in part)
108 - red maple

R8 CISC Forest Type represented on GWNF:

71 - *black ash-American elm-red maple*

Physiographic Provinces (after Fenneman 1938):

Coastal Plain (Embayed, Sea Island, East Gulf and Mississippi Alluvial sections), Piedmont (all sections), Ridge and Valley (Hudson-Champlain and Middle sections), Appalachian Plateaus (Alleghany Mountain, Unglaciated and Glaciated Alleghany Plateau, Catskill Mountains, and Mohawk sections), New England (Green Mountain, Taconic, Upland and Seaboard Lowland sections), Interior Low Plateau (all sections), and Central Lowland (all sections).

Tentative approximate minimum stand age at which old growth characteristics begin development: 80 years

Narrative Description:

Hardwood wetland forests occur primarily in the north and central tiers of states, ranging from southern Minnesota through Arkansas in the West to the Carolinas northward to southern Maine in the East. In Minnesota, Wisconsin and Michigan, its northern limit roughly corresponds to the vegetative tension zone. These forests occur mainly in nonriverine, topographically-defined basins on uplands (e.g. kettleholes), although they can be found along smaller drainages (1st-4th order streams) and along the margins of Coastal Plain ponds and bays Because of their topographic position, high water tables prevail (soil mottling close to the surface), and most sites are moist to wet throughout the year These wetlands are typically oligotrophic, although these systems may be more fertile in the South. Soils can be either mineral or organic, and neutral to slightly acid in pH

Species composition varies appreciably between forests Dominant trees include red maple (*Acer rubrum*), black ash (*Fraxinus nigra*), green ash (*F. pennsylvanica*), elms (*Ulmus*), sweetgum (*Liquidambar styraciflua*), pin oak (*Quercus palustris*) and black tupelo (*Nyssa sylvatica*) Common associates very by region: balsam poplar (*Populus balsamifera*), yellow birch (*Betula alleghaniensis*) and paper birch (*B papyrifera*) in northern states, and silver maple (*A saccharinum*), swamp white oak (*Quercus bicolor*), bur oak (*Q. macrocarpa*), sycamore (*Plantanus occidentalis*) and eastern cottonwood (*P. deltoides*) in central states. Due to Dutch elm disease, elm representation has dropped considerably over the past several decades, and at present is largely relegated to understory positions Conifers are rarely present. Highbush blueberry (*Vaccinium corymbosum*), black chokeberry (*Aronia melancarpa*) and holly (*Ilex*)) are common shrubs. If the shrub layer is poorly developed, a continuous ground cover of mosses and ferns is usually present.

Topographic position and prevailing moist conditions help protect theses forests from fire. Since high water tables restrict rooting and limit tree anchorage, these forests are quite prone to windthrow This type of disturbance causes a prevalence of tip-up mounds, downed trees and canopy gaps Tree mortality is also caused by fluctuating water levels or flooding due to beaver activity Hardwood wetland forests are distinguished from seasonally wet oak-hardwood woodlands (OGFT27) by 1) lacking seasonal dryness, 2) having less oak (*Quercus*) and 3) experiencing little to no disturbance from fire Small inclusions of hardwood wetland forest may occur within wetter sections as seasonally wet oak-hardwood woodlands

21. DRY-MESIC OAK FORESTS

SAF Forest Cover Types:

44 - chestnut oak
52 - white oak-black oak-northern red oak
53 - white oak
55 - northern red oak
110 - black oak

R8 CISC Forest Type represented on GWNF:

52 - chestnut oak
53 - white oak-red oak-hickory
54 - white oak
55 - northern red oak
59 - scarlet oak
60 - chestnut oak-scarlet oak

Physiographic Provinces (after Fenneman 1938):

All provinces in the East except for the New England (White Mountain section) and Adirondack provinces.

Tentative approximate minimum stand age at which old growth characteristics begin development· 130 years

Dry-mesic oak forests occur throughout most of the eastern United States Within this area, these forest have peak representation in the mountainous regions of the East (i.e. Appalachians, Ozarks and Ouachitas). As the name implies, these forests are found on drier, somewhat impoverished, upland sites. In the mountains, these forests are most common on south- and west-facing upper slopes and ridgetops, however they frequently cover entire mountains (except for mesic coves and seeps) where precipitation or soil moisture retention is limiting. In regions with gentle terrain, these forests are restricted to sandy, well- to excessively-drained hills and flats.

Since this forest type covers a large geographical area, principal represen- tatives vary considerably from location to location, and some rarely co-occur. The main species include chestnut oak (*Quercus prinus*), northern red oak (*Q. rubra*), black oak (*Q. velutina*), white oak (*Q. alba*) and scarlet oak (*Q coccinea*). Common associates are southern red oak (*Q. falcata*), post oak (*Q. stellata*), blackjack oak (*Q mirilandica*), pignut hickory (*Carya glabra*), mockernut hickory (*C. tomentosa*) and red maple (*Acer rubrum*) Up until the 1930's, American chestnut (*Castanea dentata*) was an important cohort of many oak forests (Keever 1953). Conifers such as table mountain pine (*Pinus pungens*), shortleaf pine (*P. echinata*) and eastern white pine (*P. strobus*), may occur, however their combined overstory coverage is less than 25%.

Dry-mesic oak forests have evolved in a disturbance regime where recurring fire was quite important. The prevailing dry conditions made these forests conducive to burning, and both lightning and Indians were important ignition sources in the presettlement era Most fires during this time period were probably

low-intensity, surface burns, typical in broadleaf forests. These fires helped maintain the oak component by largely eliminating fire-sensitive competitors and creating conditions needed for successful oak regeneration (e.g. encouraging high light conditions in the understory). Fire suppression over the last century has led to "unnatural" conditions, and many forests are now vulnerable to successional changes (Nigh et al. 1985). Without fire, oak forests become stagnant and are apt to be replaced by more shade tolerant species, at least on sufficiently moist sites. However, forests on drier, edaphically-poor sites are probably quite stable since there are few replacement species that can tolerate such extreme site conditions.

22 DRY AND XERIC OAK FORESTS, WOODLANDS AND SAVANNAS

SAF Forest Cover Types:

14 - northern pin oak
40 - post oak-blackjack oak
42 - bur oak
43 - bear oak (in part)
44 - chestnut oak
67 - Mohrs ("shin") oak
72 - southern scrub oak
89 - live oak
110 - black oak

R8 CISC Forest Type represented on GWNF

51 - post oak-black oak

Physiographic Provinces (after Fenneman 1938):

All provinces except for the New England (Green and White Mountain sections) and Adirondack.

Tentative approximate minimum stand age at which old growth characteristics begin development: 130 years

Narrative Description:

Dry and xeric oak forests, woodlands and savannas are found throughout most of eastern United States, from North Dakota south to Texas in the West across to the Eastern Seaboard from southern Maine to Florida Often referred to as oak barrens, this forest type group is indicative of infertile, droughty uplands. Representative stands also occur on steep, south-facing slopes or along rock outcrops. Stands are most common on coarse-textured soils, or in areas where bedrock is near the surface and soil moisture is limiting. Soils are typically Inceptisols, Entisols or Spodosols Although dry site conditions may prevail throughout most of the year, soil moisture deficits are most severe during the summer months. Due to the severe environmental conditions, individuals trees normally have a stunted, gnarled appearance.

Historically, open oak woodlands and savannas were maintained by periodic surface fires. Fires burned frequent enough to restrict tree density, thus maintaining open conditions. This, in turn, allowed shade intolerant grasses, forbs and shrubs to dominate the understory Fire suppression associated with Euro-

pean settlement has allowed many former stands to convert to closed-canopy forests. Hence, most present-day woodlands and savannas are mainly restricted to sites that edaphically limit tree density (e.g soil moisture).

A great deal of variability exists within this forest type group due to the large area it covers as well as the number of oak species that can dominate.

The most common and widespread variant occurs throughout the central portion of the eastern United States and extends into the Northeast Dominants include white oak (*Q. alba*), black oak, post oak (*Q. stellata*), blackjack oak (*Q marilandica*), chestnut oak (*Q prinus*) and scarlet oak (*Q. coccinea*). Historically, open stand conditions were maintained by recurring surface fires.

24. XERIC PINE AND PINE-OAK FORESTS AND WOODLAND

SAF Forest Cover Types·

43 - bear oak (in part)
45 - pitch pine (in part)
51 - white pine-chestnut oak (in part)
75 - shortleaf pine
76 - shortleaf pine-oak
78 - Virginia pine-oak
79 - Virginia pine

R8 CISC Forest Type represented on GWNF:

12 - shortleaf pine-oak
15 - pitch pine-oak
20 - table mountain pine-hardwood
32 - shortleaf pine
38 - pitch pine
39 - table mountain pine
49 - bear oak-scrub oaks-yellow pine
57 - scrub oak

Physiographic Provinces (after Fenneman 1938)

Coastal Plain (Embayed, Sea Island, East Gulf, Mississippi Alluvial, and West Gulf sections), Piedmont (all sections), Blue Ridge (all sections), Ridge and Valley (all sections), Appalachian Plateaus (all sections), New England (all sections) Interior Low Plateau (all sections), Central Lowland (Till Plains section), Ozark Plateaus (all sections), and Ouachita (all sections)

Tentative approximate minimum stand age at which old growth characteristics begin development: 80 years

Narrative Description:

Xeric pine and pine-oak forests and woodlands are found throughout most of the eastern United States, from southern Missouri to northeast Texas, eastward to the Atlantic coastline from southern Maine to South Carolina. These communities normally exist on sites with extreme moisture and nutrient deficiencies. Xeric site conditions may exist due to any number of reasons: 1) low precipitation, 2) limited moisture absorption/ retention (exposed bedrock, steep slopes, coarse-textured soils, shallow soils) and/or 3) elevated evapo-transpiration rates (southern exposures). Most pine and pine-oak forests and woodlands occur on ridgetops and south-facing, upper slopes in the mountainous or excessively-drained, sandy uplands on gentler terrain (e.g. Piedmont). Soils are normally quite acidic.

Principal species of these xerophytic communities include pitch pine (*Pinus rigida*), Virginia pine (*P. virginiana*), shortleaf pine (*P. echinata*), table mountain pine (*P. pungens*), eastern white pine (*P. strobus*), and chestnut oak (*Quercus prinus*). Associate species are scarlet oak (*Q. coccinea*), black oak (*Q. velutina*), blackjack oak (*Q. marilandica*), post oak (*Q stellata*), northern red oak (*Q. rubra*), southern red oak (*Q falcata*), white oak (*Q alba*), and pignut hickory (*Carya glabra*). Understories predominantly consist of ericaceous shrubs and, within its range, bear oak (*Q. ilicifolia*)

Due to the prevailing xeric conditions, these forests and woodlands have historically experienced frequent fires During the presettlement era, most fires were probably low intensity, surface burns, although occasional catastrophic canopy fires undoubtedly occurred in some stands. Periodic burns are more-or-less required by these early-successional forests for maintenance purposes, especially the pines (*Pinus*). Without fire, the pine component quickly becomes decadent, and over extended periods increases in dead biomass can predispose these forests to catastrophic fire However, even in the absence of fire, successional changes are normally quite restricted (possibly ending with oak domination) since most sites are very nutrient- and moisture- limiting

24. DRY AND DRY-MESIC OAK-PINE FORESTS

SAF Forest Cover Types.

- 51 - white pine-chestnut oak
- 75 - shortleaf pine
- 76 - shortleaf pine-oak
- 78 - Virginia pine-oak
- 79 - Virginia pine
- 80 - loblolly pine-shortleaf pine
- 81 - loblolly pine
- 82 - loblolly pine-hardwood

R8 CISC Forest Type represented on GWNF:

- 42 - upland hardwood-white pine
- 45 - chestnut oak-scarlet oak-yellow pine

47 - white oak-black oak-yellow pine
48 - northern red oak-hickory-yellow pine

Physiographic Provinces (after Fenneman 1938):
Coastal Plain (all sections), Piedmont (all sections), Blue Ridge (all sections), Ridge and Valley (all sections), Appalachian Plateaus (all sections), Ozark Plateaus (all sections), and Ouachita (all sections).

Tentative approximate minimum stand age at which old growth characteristics begin development· 130 years

Narrative Description.

Dry and dry-mesic oak-pine forests constitute a large part of the Eastern Deciduous Forest, extending from southern Missouri to east Texas in the West across to the Atlantic Coast from New Jersey to north Florida Most forests occur on excessively- to well-drained, coarse-textured soils on ridges and south-facing slopes in the mountains and droughty uplands on the Piedmont and Coastal Plain. Soils are often shallow, rocky and infertile, and most are derived from sandstone or shale. The inherent dryness of these sites makes them particularly prone to fire.

Principal associates vary widely based on latitude, topography, geography, and disturbance regime. On dry sites, forests consist of shortleaf pine (*Pinus echinata*), Virginia pine (*P virginiana*), table mountain pine (*P. pungens*), pitch pine (*P rigida*), post oak (*Quercus stellata*), chestnut oak (*Q prinus*), scarlet oak (*Q coccinea*), and blackjack oak (*Q. marilandica*). Loblolly pine (*P taeda*), longleaf pine (*P. palustris*), white oak (*Q. alba*), southern red oak (*Q. falcata*), black oak (*Q. velutina*), mockernut hickory (*Carya tomentosa*), pignut hickory (*C. glabra*), black tupelo (*Nyssa sylvatica*), and sweetgum (*Liquidambar styraciflua*) are more prominent on dry-mesic sites Since most of the above species have ranges restricted to certain physiographic provinces, not all of them co-occur Both pines and oaks usually initiate soon after disturbances, however the former usually dominate immediately following disturbances, and tend to yield to the latter over time.

These forests were historically maintained by fire, and probably responded favorably to the large-scale disturbances (logging and subsequent fires) initiated by early European settlers However, fire suppression during this century has allowed more shade tolerant species, such as red maple (*Acer rubrum*), to increase in understory frequency. In the absence of fire over extended periods, future shifts in composition seem inevitable However, the actual direction of succession is obscure at this time since the rate of change of these forests is gradual due to the long life spans of the principal species. Indeed, fire is an integral part of these forests and is needed for their perpetuation

28 EASTERN RIVERFRONT FORESTS

SAF Forest Cover Types:
61 - river birch-sycamore
62 - silver maple-American elm

63 - cottonwood
89 - live oak
94 - sycamore-sweetgum-American elm
95 - black willow

R8 CISC Forest Type represented on GWNF:
72 - river birch-sycamore
73 - cottonwood

Physiographic Provinces (after Fenneman 1938):
All provinces except for New England (White Mountain, Green Mountain, and Taconic sections), Adirondack, and Superior Upland.

Tentative approximate minimum stand age at which old growth characteristics begin development: 80 years

Narrative Description:

Eastern riverfront forests occur over a large portion of the eastern United States, essentially from the forest-prairie margin eastward to the Atlantic coastline from Massachusetts to northeast Florida. These forests are most abundant within the Mississippi River watershed and along the East Coast, and are least common in the Appalachians. As the name implies, the forest type is predominant on sites immediately adjacent to larger rivers and streams (i e. river banks and first bottoms, natural levees, sandbars and islands). Soils are alluvial and range widely in texture from sand to clay. Soils are generally moist year-round due to their topographic position and proximity to open water. Flooding occurs seasonally on most sites, and often causes physical damage to the vegetation. Because of flooding and rapid decomposition rates, litter accumulations on the forest floor are negligible except in depressions

The principal species in Eastern riverfront forests include river birch (*Betula nigra*), sycamore (*Platanus occidentalis*), silver maple (*Acer saccharinum*), American elm (*Ulmus americana*), eastern cottonwood (*Populus deltoides*), swamp cottonwood (*P. heterophylla*), sweetgum (*Liquidambar styraciflua*), and black willow (*Salix nigra*) Live oak (*Quercus virginiana*) is an important component in southern forests. Common associates are red maple (*A rubrum*), boxelder (*A. negundo*), hackberry (*Celtis occidentalis*), slippery elm (*U. rubra*), black walnut (*Juglans nigra*), pin oak (*Q. palustris*), swamp white oak (*Q. bicolor*), green ash (*Fraxinus pennsylvanica*), sugarberry (*C. laevigata*), water oak (*Q nigra*) and pecan (*Carya illinoensis*).

These pioneer forests are restricted to riparian zones where intense flooding events, such as ice and water scouring, routinely occur. These naturally- occurring perturbations expose mineral soil, reduce competing undergrowth and increase surface light levels; conditions required by the shade-intolerant species of this type In this sense, flooding is considered a rejuvenating force Within a dynamic river system, the location of these forests will shift as the river course changes, remaining adjacent to the active channel. In the absence of major flooding events, these forests are susceptible to encroach- ments by shade tolerant species Indeed, many present-day stands are in jeopardy of successional change since hydrologic alterations by humans (e g dam and dike construction) has largely controlled this force in many locations.

37. ROCKY, THIN-SOILED, EXCESSIVELY-DRAINED CEDAR WOODLANDS

SAF Forest Cover Types:
37 - northern white cedar (in part; limestone cliff faces)
46 - eastern red cedar

R8 CISC Forest Type represented on GWNF
35 - eastern red cedar

Physiographic Provinces (after Fenneman 1938):
Coastal Plain (Embayed section), Piedmont (all sections), Blue Ridge (all sections), Ridge and Valley (all sections), Appalachian Plateaus (all sections), New England (all sections), Adirondack, Interior Low Plateau (all sections), Central Lowland (all sections), Superior Upland (all sections), Ozark Plateaus (all sections), and Ouachita (all sections)

Tentative approximate minimum stand age at which old growth characteristics begin development: 80 years

Narrative Description:

Rocky, thin-soiled, excessively-drained cedar woodlands are found in mountainous regions in the East as well as on less rugged, glaciated terrain. These cedar woodlands occur on three xeric landforms: 1) mountainous areas where thin and rocky soils exist due to colluvial forces (i.e ridgetops, rock outcrops and steep slopes), 2) recently glaciated areas where resistant bedrock is exposed (e g. northern Minnesota) and 3) glacial outwash plains and dunes where excessively-drained, infertile conditions prevail. Overall, soils tend to be acidic and coarse-textured, except for those that are derived from limestone

Dominant conifers consist of either northern white cedar (*Thuja occidentalis*); most prevalent in the Lake States and Northeast) or eastern redcedar (*Juniperus virginiana*, most prevalent in the Ozark, Ouachita and central and southern Appalachian Mountains). Tree associates are limited to xerophytic species, principally oaks (*Quercus*) and pine (*Pinus*) Tree size and density are often severely limited by poor site conditions (e.g low water holding capacity, soil infertility, etc.). Ground cover is typically comprised of ericaceous shrubs such as blueberry (*Vaccinium*) and huckleberry (*Gaylussacia*) These woodlands experience many different types of disturbance depending on their location on the landscape These woodlands are particularly susceptible to fire, especially during drought periods. Other disturbances causing tree or stand mortality include landslides, severe drought, insect and disease attacks, and blowdowns Even though fire regimes in many areas have been drastically altered due to suppression efforts, open conditions normally continue due to other site limiting factors (e g. soil moisture)

Appendix I - Environmental Impact Statement
COMMENTS AND RESPONSES*

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LEGAL REQUIREMENTS for DIVERSITY
and RATIONALE for SELECTION of MANAGEMENT INDICATOR SPECIES (MIS)

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INTRODUCTION

The purpose of this paper is to detail the analysis of the legal requirements for diversity in the National Forest Management Act (NFMA) and its regulations (36 CFR 219) and the procedures used by the interdisciplinary (ID) team revising the *Land and Resource Management Plan for the George Washington National Forest* (Forest Plan) to comply with these requirements.

The January 8, 1990 decision of Associate Deputy Chief David G. Unger on an administrative appeal of the Nicolet National Forest Land and Resource Management Plan presented the Agency position on the NFMA Requirements for diversity. In this document, he states:

> "Diversity establishes no additional requirements beyond those identified for management indicator species, for population viability of sensitive species, for the recovery of threatened or endangered species of plants and animals, and for protection of special habitats."

The analysis of diversity in the revision of this Forest Plan is complicated by public issues raised on biodiversity. Because of these issues, the revision analysis will also be addressing questions of biodiversity, old growth, fragmentation and other subjects related to biological diversity. Since the NFMA and its regulations contain no legal requirements concerning biodiversity, old growth, fragmentation, etc., this paper does not include discussions on those subjects. The process paper *Addressing Issues and Concerns in the Revision of the Land and Resource Management Plan for the George Washington National Forest*, however, contains a detailed disclosure of how the revision will be addressing these issues.

DIVERSITY

NFMA REQUIREMENTS

The National Forest Management Act of 1976 provides statutory direction for managing the National Forest System to provide for diversity of plant and animal communities. Section 6(g)(3)(B) provides:

> "...provide for diversity of animal and plant communities based on the suitability and capability of the specific land area in order to meet overall multiple-use objectives, and within the multiple-use objectives of a land management plan adopted pursuant to this section, provide, where appropriate, to the degree practicable, for steps to be taken to preserve the diversity of tree species similar to that existing in the region controlled by the plan..."

The Secretary of Agriculture's Rule and Regulations (36 CFR 219) for National Forest Land and Resource Management Planning (NFMA Regulations) address diversity (including viable populations, recovery of threatened or endangered species of plants and animals and protection of special habitats) at several points.

§219.26 states:

> "Forest planning shall provide for diversity of plant and animal communities and trees species consistent with the overall multiple-use objectives of the planning area Such diversity shall be considered throughout the planning process. Inventories shall include quantitative data making possible the evaluation of diversity in terms of its prior and present condition. For each planning alternative, the interdisciplinary team shall consider how diversity will be affected by various mixes of resource outputs and uses, including proposed management practices [Refer to Section 219.27(g).]"

§219.27(g) states:

> "Management prescriptions, where appropriate, and to the extent practicable, shall preserve and enhance the diversity of plant and animal communities, including endemic and desirable naturalized plant and animal species, so that it is at least as great as that which would be expected in a natural forest and the diversity of tree species similar to that existing in the planning areas. Reductions in diversity of plant and animal communities and tree species from that which would be expected in a natural forest, or from that similar to the existing diversity in the planning area, may be prescribed only where needed to meet overall multiple-use objectives. Planned type conversion shall be justified by an analysis showing biological, economic, social, and environmental design consequences, and the relation of such conversions to the process of natural change "

§§219.27(a)(5) requires that all management prescriptions shall:

> "Provide for and maintain diversity of plant and animal communities to meet overall multiple-use objectives, as provided in paragraph (g) of this section "

MANAGEMENT DIRECTION IN THE FOREST PLAN

Appendix G of the 1986 Forest Plan EIS contains an "Analysis of Planned Type Conversion". The conclusion in this analysis was that 3% of the George Washington National Forest would be converted to white pine to increase the percentage of pine type to 20%. The rationale for this decision was not clearly stated but seems to revolve around the "economics of pine conversion".
Page IV-28 of the Forest Plan contains the following standard and guideline:

> "Generally, sites will be converted to pine only when the site index is less than SI 60 equivalent for oak and conditions are conducive to planting. This limitation applies only to sites with existing hardwood or hardwood-pine types."

Appendix B (page B-39) of the 1986 Forest Plan EIS states:

> "Diversity of plant and animal species is ensured by two factors. The first is that the magnitude of implementation of any alternative is quite small and occurs over an extended time period. There are no overt or wholesale conversions of species contemplated. The second is the result of actions in the alternatives which, in combination, can successfully compete with natural processes occurring over the long time span."

This practice remained very controversial throughout the implementation of the Forest Plan. Amendment #4 was completed in February 1991. This amendment added the following standards to page IV-28 of the Forest Plan, effectively eliminating opportunities for conversion of hardwood or hardwood–pine forest types to pine or pine–hardwood forest types:

> "Plant white pine only in the four forest types where white pine is a major component: white pine, white pine–hemlock, white pine–upland hardwood and white pine–cove hardwood. Plant white pine on a 15' x 15' spacing (194 seedlings per acre) to meet a mixed stand management objective.
>
> Plant pine species other than white pine (such as shortleaf pine, Virginia pine or pitch pine) as long as the species being planted was a component of the stand prior to that stand being cut. Plant seedlings at spacings that would result in a stocking of 300 seedlings per acre (the minimum level established in the Forest Plan and Regional Guide for other pine species) after the third year survival check."

ANALYSIS OF OPPORTUNITIES FOR TYPE CONVERSION

In light of the controversy surrounding the conversion of hardwood or hardwood–pine forest types to pine or pine-hardwood forest types and the replacing of one pine species with another during reforestation, the ID team explored the possible advantages that such conversion would achieve.

The financial analysis performed in Stage 2 Timber Resource Land Suitability revealed that clearcutting with conversion to white pine on lands in the Upland Hardwood Working Group with site indices of 50 or less was financially less attractive than than regenerating such lands to upland oak by natural regeneration. Therefore, the rationale used in the Forest Plan EIS to justify planned type conversion appears to be flawed based on the analysis performed as part of the revision of the Forest Plan. A discussion of the procedures and findings of the financial analysis is contained in the process record Incorporation of the NFMA Requirements for Timber Resource Land Suitability into the Revision of the Land and Resource Management Plan for the George Washington National Foest.

While there may be some advantages to planting small areas to white pine for wildlife cover or to rehabilitate sensitive viewsheds receiving heavy damage from gypsy moth defoliation or wildfire damage, these would be unusual circumstances outside the realm of programmatic planning.

The only instance that the ID Team identified where planned type conversion *might* by justified at a programmatic level was when gypsy moth mortality or oak decline had eliminated the potential for natural regeneration of desirable hardwoods. In this instance, the NFMA regulation concerning the regeneration of stands within 5 years after final harvest [36 CFR 219.27(c)(3)] would not be met This requirement relates to lands which are suitable for timber production. In essence, gypsy moth mortality or oak decline would cause the paradox that some lands identified as suitable for timber production would either have to be artificially regenerated or designated as unsuitable for timber production. Given the economics of hardwood regeneration, most hardwood stands unable to be naturally regenerated would be artificially regenerated to pine-hardwood by planting white pine seedlings on a 15' x 15' spacing Such a practice would constitute type conversion.

The ID Team determined that this requirement could not be analyzed at the programmatic level of the revision. There is insufficient information available to understand under what conditions and how often gypsy moth mortality or oak decline would cause a failure of natural regeneration in hardwood stands. This concern must be addressed and analyzed at the project-level during implementation. Site-specific analysis would have to determine whether such conversion is justified

The question of regenerating the Virginia and Yellow Pine Working Groups to the White Pine Working Group remains a controversial subject. The financial analysis revealed that replacing a Virginia or yellow pine forest type with white pine was less financially attractive than any other type of regeneration method analyzed.

The ID Team, therefore, decided not to analyze the use of *planned* type conversion on the George Washington National Forest as part of the revision of the Forest Plan. Specific instances may occur during project—level implementation when such practices might be justified. If this occurs, the project—level analysis must bear the burden of providing a justification for such type conversion.

VIABLE POPULATIONS

NFMA REQUIREMENTS

§219.19 states:

> "Fish and wildlife habitat shall be managed to maintain viable populations of existing native and desired non-native vertebrate species in the planning area. For planning purposes, a viable population shall be regarded as one which has the estimated numbers and distribution of reproductive individuals to insure its continued existence is well distributed in the planning area. In order to insure that viable populations will be maintained, habitat must be provided to support, at least, a minimum number of reproductive individuals and that habitat must be well distributed so that those individuals can interact with others in the planning area."

§§219.27(a)(6) *requires that all management prescriptions shall:*

> "Provide for adequate fish and wildlife habitat to maintain viable populations of existing native vertebrate species and provide that habitat for species chosen under [Section] 219.19 is maintained and improved to the degree consistent with multiple-use objectives established in the plan..."

MANAGEMENT DIRECTION IN THE FOREST PLAN

Appendix B (page B-38) of the current (1986) Forest Plan EIS states:

> "To guarantee maintenance of habitat for minimum viable wildlife population, constraints were placed on the FORPLAN model. After analysis of individual species requirements, the minimum calculated requirements were consolidated into the following modeling constraints:
>
> 1% in openings - age 1-12
> 10% in hardwoods - age 40-120
> 2.6% in hardwoods - age 60+
> 2.5% in hardwoods - age 200+
>
> *These constraints are applied in all benchmarks and alternatives.*"

Chapter IV (pages IV-18 thru IV-21) of the 1986 Plan contains *Forest-Wide Management Requirements* for five featured species (white-tailed deer, black bear, wild turkey, ruffed grouse, and gray squirrel) and two indicator species (pileated woodpecker and common flicker).

Chapter IV (pages IV-21 thru IV-23) of the 1986 Plan also contains *Forest-Wide Management Requirements* for cold water streams, featured brook trout streams, cold water lakes, cool/warm water streams, and cool/warm water lakes and ponds.

The *Forest-Wide Management Requirements* (page IV-20) of the existing Forest Plan contains the following statements for sensitive, threatened or endangered species under "Standards and Guidelines":

> "Do not allow disruptive habitat manipulation within 150 feet of entrances to caves known to be suitable for bat habitation. Other cave entrances will be protected by at least a 50-foot buffer zone.
>
> "Locations of plant communities or individual species identified as sensitive will be designated as Special Interest Areas and protected from disturbance. Suggested management for each known area can be found in Appendix E of the FEIS."

On July 27, 1989, the Regional Forester signed the Record of Decision for the *Final Environmental Impact Statement – Vegetation Management in the Appalachian Mountains.* This decision included Amendment #3 to the *Land and Resource Management Plan for the George Washington National Forest.* Two of the standards in this document relate to the protection of threatened, endangered, proposed, and sensitive species:

> "81. 2,4-D, 2,4-DP, and triclopyr are not aerially applied within 300 feet, nor ground-applied within 60 feet of known occupied gray, Virginia big-eared, or Indiana bat habitat The same buffers are used with 2,4-D around habitat of these sensitive species: star-nosed mole, old field mouse, masked shrew, southeastern shrew, southern pigmy shrew, long-tailed shrew, southern water shrew, southern rock vole, red-backed vole, Keen's myotis eastern small-footed bat, and Rafinesque's big-eared bat. The same buffers are used with any formulation containing kerosene or diesel oil around habitat of any threatened, endangered, proposed, or sensitive bird during its nesting season. Buffers are clearly marked before treatment so applicators can easily see and avoid them."
>
> "82 No herbicide is aerially applied within 300 feet, nor ground-applied within 60 feet, of any known threatened, endangered, proposed, or sensitive plant. Buffers are clearly marked before treatment so applicators can easily see and avoid them."

VIABLE POPULATIONS IN RELATION TO THE REVISION

The following quotation by Charles F. Wilkinson and H. Michael Anderson from page 298 of "Land and Resource Planning in the National Forests" in Volume 64 Number 1 & 2 of the *Oregon Law Review* provides a perspective on viable populations that is useful to remember:

> "The meaning of the term 'viable population' is likely to be highly controversial in planning. The regulations state that 'in order to insure that viable populations will be maintained, habitat must be provided to support, at least, a minimum number of reproductive individuals....' The phrase 'minimum number' might be interpreted to allow planners to set habitat and population levels at the

margin between viability and nonviability as one of the planning alternatives. However, marginally viable populations are not legally supportable.

First, the regulations require the Forest Service to provide sufficient habitat ot 'insure' the continued existence of existing vertebrate species in each national forest. Planners must allow for contingencies that threaten a species' viability. Examples of such hazards would include fire, disease, pest infestation, accidental chemical exposure, and natural ecological changes. These contingencies are often reasonably predictable, and their likelihood and impact on wildlife can be determined through historical and experimental data. Populations that are vulnerable to extirpation by foreseeable contingencies are not ensured of continued existence; they are not viable. Planners therefore do not meet the legal requirements of the regulations by setting minimum viable population levels that assume ideal conditions. A realistic safety factor must be built into the minimum level alternative that accounts for the unknown.

Moreover, forest plans must insure that viable populations of vertebrates are 'well distributed in the planning area ' Habitat 'must be well distributed so that [reproductive] individuals can interact with others in the planning area. Thus, while plans can result in habitat conditions that reduce a species' *density*, the plans must allow that species to maintain its *distribution*. The practical effect of this requirement, which was added to the 1982 revision of the NFMA regulations, is to make distribution of wildlife habitat a controlling factor in forest planning.

Species isolation, which can result from a sudden decrease in habitat area, has been called 'the trigger for an erosion of species diversity.' The distribution requirement will prevent species from becoming isolated on islands of suitable habitat. For instance, planners may not rely on a single wilderness area to furnish habitat for a species dependent on old-growth forests or roadless solitude, if that habitat exists elsewhere in the national forest. In addition, by distributing habitat, planners will be able to provide greater safety against events that could threaten viability."

Aquatic Species

§§219.27(a)(6) of the NFMA Regulations requires providing for "adequate fish and wildlife habitat to maintain viable populations of existing native vertebrate species...." Although this is a much lower level than is currently managed for on the George Washington National Forest, viable populations must be addressed to meet the NFMA Regulations.

As discussed in the *Analysis Of The Management Situation*, George Washington National Forest, February, 1984, pages 48-52, the viable population level for native brook trout is considered to be 5 pounds per acre in flowing waters. Average trout populations approximate 30 pounds per acre for Virginia Division of Game and Inland Fisheries (VDGIF) identified Class I and II streams and averages 15 pounds per acre for Class III and IV streams. For the larger coolwater streams and rivers, viable populations would be something less than 50 pounds per acre with 15% as gamefish. Lakes and ponds would have a viable fish population of not less than 15 pounds per acre of all species if adequately stocked. The only natural lakes/ponds on the George Washington National Forest are limestone sinkholes that, other than Trout Pond, historically did

not contain fish. Other than Todd Lake, the limestone sinkholes and wildlife ponds under 1/2 acre, all others are managed for gamefish production/harvest at increasing levels of intensity with fish biomasses in excess of 25 pounds per acre.

The Forest has made the determination that existing stream and lake habitat conditions are capable of supporting greater than viable populations of resident fish. Freshwater habitat for fish (spawning and rearing habitat) is sufficient to support viable populations in most Forest watersheds. More specifically, conditions necessary to maintain viable populations of the indicator species trout in their headwater environments is considered more than sufficient to sustain other fish populations above minimum viable levels in the downstream lakes and cool to warmwater streams and rivers (i.e. sunfish populations and non-game species).

Threats to the viability of fish populations consists of illegal harvest, fish passage barriers, water quality problems including acid rain, physical habitat structure degradation, and droughts or floods. Illegal harvest, physical barriers, water quality problems including acid rain and physical habitat degradation can be or are man-caused problems. Natural events such as droughts or record floods (water quantity) can cause or significantly contribute to these threats.

Droughts, floods and acid rain are generally considered to have the most adverse impact on the Forest's aquatic resources. These aquatic resources can generally rebound from droughts and floods but that is not the case with acid rain. Rebounding from droughts and floods may even be jeopardized by acid rain.

Sampling of 350 native brook trout streams in the mountains of Virginia during the 1987 Virginia Trout Stream Sensitivity Study (VTSSS) identified 10% of the streams with zero or negative acid buffering capacity, 49% with 100 ueq/l of alkalinity or less and 93% with 200 ueq/l or less alkalinity. Analysis of this state-wide data for just the Forest, subsequent VTSSS quarterly sampling and James Madison University cooperative sampling with the Forest, shows these percentages to hold true across the Forest as a whole.

Streams that are acidic with no buffering capacity have their fish populations in immediate jeopardy, have depressed fish biomass and likely have lost one or more non-game fish species (and aquatic insect species) based on VDGIF data from St. Marys River and Little Stony Creek. Brook trout are generally the most acid tolerant and therefore the last fish species to disappear. Streams that are in the 0-100 ueq/l alkalinity range are classified as extremely sensitive and could be expected to go acidic within the next decade or two or even sooner unless sulfate emissions are reduced to levels where sulfuric acid consumption of alkalinity equals production of natural alkalinities through weathering of bedrock. Streams in the remaining category are considered sensitivity and while their fish population may be less than maximum sustainable, fish species losses are not anticipated.

Generally the headwater fish populations are the most threatened. As the streams drop lower in elevation, buffering capacity increases with changes in geology. Most non-game species associated with trout in the headwaters extend downstream far enough that while they can be lost in the headwaters to decreases in pH, the downstream segments of the populations will survive. Total species losses in large watersheds are not anticipated but reductions in range and biomass would be anticipated.

A spatial requirement is also called for in determining viable population levels in that "habitat must be well distributed so that those individuals can interact with others in the planning area." In the case of acid deposition, it is beyond the present control of the Forest to deal with fish species/population distribution and losses. Stream buffering capacity is predominately a function of bedrock geology. However, to address the spatial requirement, viable fish populations are further defined as 50% of existing trout distribution which corresponds to those streams with alkalinities above 100 ueq/l. These streams are scattered across the Forest and generally consist of clusters of streams in drainages that are on a particular bedrock type. This will provide for some interaction between populations if they are interconnected without fish passage barriers, either physical or water quality/temperature.

Extensive research on addition of limestone or similar products to streams, lakes and watersheds is being conducted in the Northeast including two streams on the George Washington National Forest. While there appears to be promise in the technique being used on the Forest, it is too early to make the assumption that a significant change in acid sensitivity can be made. Research continues on this problem both in monitoring sensitivity levels and in short-term modification of water chemistry by dumping limestone sand in streams.

While floods, droughts and acid rain are the most significant impacts to fish distribution and population levels on the Forest, timber harvest and ground disturbing activities have the potential to impact fish populations through reduction in habitat structure and water quality, in this case sedimentation and water temperature.

The Clean Water Act (PL92-500) requires the protection of water quality in order to protect the beneficial uses of the waters. In the case of the Forest's water, those beneficial uses are generally related to recreation, fisheries, and/or drinking water. Section 319 of the Clean Water Act (1987 amendment) is the most applicable to Forest management activities. Under Section 319, Virginia and West Virginia prepared State management plans that included BMP's to control nonpoint sources of pollution. Under the Act the national forests must comply with State Water Quality regulations. Although Virginia and West Virginia have *voluntary* programs, the George Washington National Forest has adopted the silviculture BMP's from each state as a *minimum requirement* for prevention of nonpoint pollution and protection of fish habitat. Additional standards are being developed for alternatives to the Revised Forest Plan to provide more site specific BMP's where it was felt additional protection is needed to protect beneficial uses.

When BMP's are implemented, primarily through the management of non-point source pollution and the structural and non-structural components of the habitat, fish habitat will not be degraded to a level that viable fish populations are threatened.

With the additional of a standard for minimizing/avoiding stream-disturbing activities in trout streams during periods of egg incubations and fry development (page IV-21) in the existing Forest Plan, the specific standards discussed under WATER BODIES (INCLUDING RIPARIAN AREAS) would provided the mitigation needed to meet this management requirement.

The additional standard is:

- In cold water habitat, activities that adversely affect trout spawning are avoided from October 1 to April 1 in brook trout and brown trout streams and/or March 15 to May 15 in rainbow trout streams. Any necessary in-stream disturbance activities within these time limits must have consultation from state and Forest Service biologists.

This standard is listed as number 18-13 under Management Area 18 in Chapter 3 of the Revised Plan

Terrestrial Species

§219.19(a)(1) of the NFMA Regulations directs the planning team to select Management Indicator Species (MIS). Species are to be selected from up to five categories: (1) rare, threatened or endangered, (2) species whose habitats may be influenced by management activities, (3) species commonly hunted, (4) non-game of special interest, and (5) species whose population changes are believed to indicate the effects of management activities on other species or selected major biological communities.

MIS selected for the 1986 Plan included the **black bear, wild turkey, white-tailed deer, common flicker,** and **pileated woodpecker.** For the revision, additional selections are warranted to better meet the intent of Section 219.19.

Careful screening was given to species to best meet the intent of this section Migratory species are generally not good MIS candidates as many unmeasurable factors outside of the planning boundary may contribute to population fluctuation Some species are too difficult to monitor, or too little is known about their normal population fluctuations.

Additional species selected broaden the Forest's ability to measure changes. Most are fairly easy to monitor, are generally non-migratory, will give us better measurement tools to gauge effects of gypsy moth defoliation, gypsy moth spraying and forest fragmentation. All federally listed Endangered or Threatened species known to inhabit the George Washington National Forest are included but discussed under the section THREATENED AND ENDANGERED SPECIES.

Additional MIS species include:

Cave dwelling bats (as a group). Species known to hibernate in caves located on the Forest include the big brown bat, keen's myotis, eastern small-footed bat, little brown bat, and pipistrelle, (Indiana bat is listed separately). These species are sensitive to disturbance. Gypsy moth defoliation, and/or spraying may lead to changes in available food source.

Brown-headed cowbird. This is a parasitic species needing open areas. Selection of this species represents an attempt to quantify fragmentation in terms of intrusion of this species into forested areas.

Ovenbird and Worm eating warbler. These area sensitive species are particularly vulnerable to forest fragmentation for two reasons: (1) they require relatively large undisturbed tracts for optimal habitat; and (2) as ground nesters, they are especially vulnerable to predators. Openings, and the resultant edge are attractive habitat for cowbirds (parasitic nester), and mammalian and avian predators.

Cow Knob salamander. This species is one of the woodland salamanders of the genus *Plethedon* which lives, breeds and produces young on land. It prefers late successional habitat. Its habitat could be fragmented through intensive timber management, or altered by gypsy moth defoliation.

Tiger Salamander. This species breeds and reproduces in sink hole ponds.

Yellow Pine Community. Represents 25% of forested lands and is dependent on fire for regeneration.

Old Growth Forest Type. Represents forest conditions necessary for species requiring mature forests.

As directed in §§219.19(a)(3) consultation about selection of MIS was made with the Virginia Department of Game and Inland Fisheries, West Virginia Department of Natural Resources, Virginia Natural Heritage program, and the US Fish and Wildlife Service Most of these species were initially identified to the public (5/90) via Forest Planning brochure titled *George Washington National Forest Issues*. The general public was encouraged to comment on any item in the tabloid by writing to the Forest Supervisor. No comments were received concerning MIS.

The public had an opportunity to review and comment on management indicator species during the public review of the draft environmental impact statement. Comments on management indicator species are included in Appendix I of this FEIS.

RATIONALE FOR SELECTING MANAGEMENT INDICATOR SPECIES BASED ON NFMA CRITERIA

Species	Criteria Under Section 219.19(a)(1) That Each MIS Species Meets					
	1	2	3	4	5	
white-tailed deer			X			
black bear		X*	X			* Requires remote habitat & component of old trees
cave dwelling bats		X*		X		• Cave hibernators
wild turkey			X			
common flicker		X*		X		* Cavity nester
pileated woodpecker		X*		X		* Requires large snags for cavities & decadent trees
ovenbird		X*		X	X	* Area sensitive species
worm eating warbler		X*		X	X	* Area sensitive species
brown-headed cowbird		X*			X	* Parasitic/invader
Cow Knob salamander		X*		X		* Needs late successional habitat & slow colonizer
eastern tiger salamander ponds to reproduce	X	X*		X	X	* Requires sink hole
yellow pine community		X			X	Fire dependent community
old growth forest types		X			X	Mature forest conditions

An estimation of Minimum Viable Populations (MVP's) for MIS are included. They are theoretical in nature, and are used NOT as a goal, but to help assure that the Revised Plan meets planning requirements. MVP's were derived after consideration of current literature, and opinions of experts

For many National Forest planning efforts there have been two MVP formula approaches commonly used to derive MVP's. One theory is the "40% rule" which subscribes that a MVP is generally 40% of a normal population. Another approach is the "500 rule" which advances the concept that it takes a minimum of 500

individuals for long-term survival. A key NFMA requirement requires that MVP's be "well maintained throughout the planning area". This latter rule does not take into account a National Forest's size. The Forest stretches 140 miles in length and is over one million acres in size. Therefore, even if 500 individuals is enough to sustain a population, depending upon its home range and mobility, this number still may not be enough to be "well distributed in the planning area".

These two rules were used sparingly in development of MVP's for the Forest.

White-tailed deer

The Forest contains approximately 1,050,000 acres = 1640 square miles. Optimal population on this forest for deer is approximately one deer per 20 to 25 acres = 25 - 30+ per square mile (VDGIF and WVDNR). Habitat carrying capacity therefore would be about 42,000+ deer.

Forty percent would equal 16,800 deer. There is a wide variation between 16,800 and 500 for a minimum population (following the two rules from above).

Deer, in general, have a home range of approximately one square mile, and to have each hypothetical square mile of national forest lands occupied by deer would take an estimated 1640 animals. This may be *too low to maintain the species "well distributed" as most of the forest is considered suitable for deer* habitat. Four deer per square mile would allow for more genetic interaction, and provide for replacement animals. This would equate to approximately 6,500 deer spread throughout the forest. 1986 Plan estimates (Appendix F, page 2) identified a MVP of 8,242, or 5 per square mile. This was qualified as being a minimum huntable population. A minimum huntable population is not a MVP. Approximately 25% of the deer population on the Forest is harvested each year – 8,242 x 75% (survival rate) = 6180. For planning purposes MVP's are estimated to be 6,500 (VDGIF concurrence).

Black Bear

Population carrying capacity under good conditions is estimated to be approximately 1 bear per square mile (VDGIF and WVDNR) on this Forest. Bears have a large home range, and an individual may occupy several square miles of forest habitat. It is estimated that a minimum viable population (not minimum huntable population) is 1 bear per 10 square miles (VDGIF concurrence). If the entire forest is occupied it would equal approximately 165 bears. Therefore it is estimated that the MVP for the black bear is 165 animals

Wild Turkey

The George Washington National Forest can support approximately 15 (10 to 20) birds per square *mile (VDGIF and WVDNR). This equates to 24600 birds throughout the Forest. A minimum of 2 birds per* square mile is estimated to be a minimum threshold level (not minimum huntable level) to maintain this species throughout the forest. This represents approximately 3300 birds and is the designated MVP for this species. (VDGIF concurrence).

Pileated Woodpecker

In oak/hickory forests in southwestern Virginia it has been estimated that the home range of a pileated woodpecker is approximately 100-200 acres (Conner, et al 1975). Home ranges may vary due to quality of habitat but generally range between 150-300 acres in the eastern United States (Kilham 1976, Hoyt 1957). If, in theory, the average home range in the George Washington National Forest were to equal 160 acres (4 per square mile), then the potential habitat carrying capability would be for approximately 6500 birds. A MVP is estimated to be one bird per square mile, or 1625 birds.

Common Flicker

As with the pileated woodpecker, it is estimated that a minimum of one bird per square mile will be necessary to maintain a MVP well distributed throughout the Forest.

Ovenbird and Worm Eating Warbler

Ovenbird and worm eating warblers are both neotropical migrants, arriving in spring and departing the Forest in the fall. Declines in populations may be caused by events happening on the wintering areas, not the Forest. Minimum viable populations are estimated to be 1 pair of breeding birds per square mile.

Brown-Headed Cowbird

Throughout its range, this species has experienced significant population increases (result of changing habitat conditions). A parasitic nester that impacts songbirds, and of particular interest, neo-tropical migrants They are far-ranging and transient. The Species gathers in flocks (off forest) during winter; individuals are attracted to the edges of forest openings for nesting. Due to its increased abundance and detrimental effects on other bird species, it will be monitored not primarily to insure MVP, but to gauge effects on other species For planning purposes, the MVP for the George Washington National Forest is assumed to be 500.

Cave Inhabiting Bats

Composed of the big brown bat, Keen's myotis, eastern small-footed bat, little brown bat, and pipistrelle. These species are difficult to maintain "well distributed" because of their specialized niche requirements. Population data gathered from the past eight years of monitoring indicate that the Forest's cave dwelling populations are relatively stable. Therefore, it is estimated the MVP for this guild (as a group) is 40% of the 1982-1990 forest average (as determined from sampling the two most populated bat caves in Bath and Augusta Counties, Va.). MVP equals 390.

Cow Knob Salamander

This species is a slow recolonizer confined to older age class stands within a narrow range. It was estimated by the Forest Biologist, who has studied this species' habitat at length, that a MVP would consist of 10 core populations throughout its current range, consisting of a minimum of 1,000 individuals per

population. Therefore, MVP for this species is estimated to be 10/10,000 (accepted by VNHP and USFWS as being a sound hypothesis).

Tiger Salamander

This species is known to occur in seasonally dry sinkhole ponds. It breeds in sinkhole ponds in late winter and early spring then disperses to terrestrial burrows up to 800 feet from the breeding pond. Population estimates have not been made for the population which occurs on the Forest. Elsewhere (Maryland and New Jersey) populations have ranged from 6 to 540 individuals.

STANDARDS

In the draft environmental impact statement and draft Revised Plan, the ID Team used "Forest-wide Standards" to ensure that the Revised Plan achieved the management requirement, under §§219 27(a)(6), of ensuring adequate habitat to maintain viable populations of management indicator species. After these documents were released for public review, the ID Team reconsidered the means of achieving this management requirement. The standards incorporated in the draft Revised Plan were easily achieved in each alternative and were not needed. In the final environmental impact statement and Revised Plan, the ID Team decided to assure viable populations of management indicator species through the monitoring of management indicator species. These monitoring requirements are listed in Chapter 5 of the Revised Plan.

THREATENED, ENDANGERED, AND SENSITIVE SPECIES

NFMA REQUIREMENTS

The resource integration requirement under §§219.19(a)(7) sets the requirement for determining critical habitat for threatened and endangered species:

> "Habitat determined to be critical for threatened and endangered species shall be identified, and measures shall be prescribed to prevent the destruction or adverse modification of such habitat. Objectives shall be determined for threatened and endangered species that shall provide for, where possible, their removal from listing as threatened and endangered species through appropriate conservation measures, including the designation of special areas to meet the protection and management needs of such species."

§§219.27(a)(8) requires that all management prescriptions shall:

> "Include measures for preventing the destruction or adverse modification of critical habitat for threatened and endangered species..."

The *Forest-Wide Management Requirements* (page IV-20) of the existing Forest Plan contains the following statement for sensitive, threatened or endangered species under "General Direction":

> "Protect and enhance habitat for sensitive, threatened and endangered species. Coordinate with State agencies, the U S. fish and Wildlife Service and informed public to identify species and habitat. Where applicable, recovery plans will be followed, if none exist specific standards and guidelines may be developed for species occurring on the Forest and listed by the U.S. Fish and Wildlife Service as threatened or endangered. Any species occurring on the Forest and under review by the U. S. Fish and Wildlife Service for possible inclusion on the threatened and endangered species list will be considered sensitive.

The *Land and Resource Management Plan for the George Washington National Forest* was amended on July 27, 1989 (Amendment #3) as part of the Record of Decision for the *Final Environmental Impact Statement — Vegetation Management in the Appalachian Mountains* This amendment added the following standards for threatened, endangered or sensitive species:

> "(2) A biological evaluation of how a project may affect any species Federally listed as threatened, endangered, or proposed, or identified by the Forest Service as sensitive, is done as part of the site-specific environmental analysis This evaluation considers all available inventories of threatened, endangered, proposed, and sensitive species populations and their habitat for the proposed treatment area. When adequate population inventory information is unavailable, it must be collected when the site has high potential for occupancy by a threatened, endangered, proposed, or sensitive species. Appendix D identifies potential adverse effects from vegetation management by species.

When adverse effects are projected, mitigation measures specified in Appendix D and this chapter are used to prevent them.

Requirements and measures for activities affecting threatened, endangered, or proposed species are detailed in species recovery plans and FSH 2609.23R. Recovery plans have been prepared for the eastern cougar, southern bald eagle, American peregrine falcon, red-cockaded woodpecker, Virginia roundleaf birch, mountain golden heather, small whorled pogonia, gray bat, Indiana bat, Virginia big-eared bat, conasauga perch, slender chub, spotfin chub, smoky madtom, yellowfin madtom, noonday snail, birdwing pearly mussel, shiny pigtoe pearly mussel, Appalachian monkey-face pearly mussel, fine-rayed pigtoe pearly mussel, dromedary pearly mussel, yellow-blossom pearly mussel, green-blossom pearly mussel, and tan riffle shell pearly mussel Chapters in FSH 2609.23R have been prepared for red-cockaded woodpecker and southern bald eagle. Requirements and measures for actions affecting sensitive species are detailed in Forest Land and Resource Management Plans.

If it is determined that the project may positively or negatively affect threatened, endangered, or proposed species, consultation is initiated with the Fish and Wildlife Service. If, during informal consultation, it is determined that the project is not likely to adversely affect listed species and the Fish and Wildlife Service so concurs in writing, consultation is terminated. However, if it is determined that the project is likely to adversely affect listed species, formal consultation is initiated.

When the evaluation indicates that a project may have an adverse effect on a sensitive species or its habitat, appropriate State wildlife agencies, natural heritage commissions, and other cooperators or species authorities are contacted to identify coordination measures. These measures are directed towards ensuring species viability and preventing negative population trends that would result in Federal listing.

(81) 2,4-D, 2,4-DP, and triclopyr are not aerially applied within 300 feet, nor ground-applied within 60 feet, of known occupied gray, Virginia big-eared, or Indiana bat habitat. The same buffers are used with 2,4-D around habitat of these sensitive animals: star-nosed mole, old-field mouse, masked shrew, southeastern shrew, southern pygmy shrew, long-tail shrew, southern water shrew, southern rock vole, red-backed vole, Keen's myotis eastern small-footed bat, and Rafinesque's big-eared bat. The same buffers are used with any formulation containing kerosene or diesel oil around habitat of any threatened, endangered, proposed, or sensitive bird during its nesting season Buffers are clearly marked before treatment so applicators can easily see and avoid them.

(82) No herbicide is aerially applied within 300 feet, nor ground-applied within 60 feet, of any known threatened, endangered, proposed, or sensitive plant. Buffers are clearly marked before treatment so applicators can easily see and avoid them."

THREATENED AND ENDANGERED SPECIES IN RELATION TO THE REVISION

The following federally-listed threatened or endangered species are known to inhabit the George Washington National Forest. Because of their status, their populations may be below a MVP level. In addition, the Forest may be on the periphery of their range, or provide inadequate natural habitat. The Forest will monitor their populations. It is Forest Service policy to help recover these species (where appropriate and within the scope of the recovery plan).

Species	Status	Estimated Forest Population
Indiana Bat	E	<50
Virginia Northern Flying Squirrel	E	<20
Peregrine Falcon	E	<10
Bald Eagle	E	<10
Eastern Cougar	E	unknown
James Spinymussel	E	unknown
Shale Barren rockcress	E	<20 colonies
Swamp Pink	T	<30 colonies
Northeastern Bulrush	E	2 populations
Virginia Big-eared Bat	E	unknown

Indiana Bat This federally endangered species hibernates in caves Unrestricted spelunking (caving) during hibernation can be very detrimental to this species.

Virginia Northern Flying Squirrel. This federally endangered species is restricted to mature red spruce/ northern hardwood areas on the Forest.

Peregrine Falcon. This federally endangered species requires a specialized nesting habitat (cliffs). It could be affected by excessive recreational use of cliffs.

Bald Eagle. This federally endangered species prefers riparian/forested areas with minimal disturbance. It might be affected by management activities in riparian areas, especially around nesting sites. Excessive recreation can displace the species from some of its better feeding grounds.

James Spinymussel. This is a federally endangered species. Its habitat is directly affected by water quality.

Shale Barren Rockcress. This is a federally endangered shalebarren endemic.

Swamp Pink This is a threatened wetland obligate species. It could be affected by illegal off-higway vehicle use, trampling, and flooding from beaver dam construction.

Northeastern Bulrush. This is a wetland obligate species listed as endangered.

The U. S. Fish and Wildlife Service has not designated any Critical Habitat (as defined in ESA) for any of these species on the George Washington National Forest.

As previously discussed, all federally listed threatened and endangered species known to inhabit the George Washington National Forest have been identified as management indicator species. As directed in §§219.19(a)(3) consultation about selection of MIS was made with the Virginia Department of Game and Inland Fisheries, West Virginia Department of Natural Resources, Virginia Division of Natural Heritage, and the US Fish and Wildlife Service.

RATIONALE FOR SELECTING FEDERALLY LISTED THREATENED AND ENDANGERED SPECIES AS MANAGEMENT INDICATOR SPECIES BASED ON NFMA CRITERIA

Species	Criteria Under Section 219.19(a)(1) That Each MIS Species Meets					
	1	2	3	4	5	
Indiana Bat	X	X*				* Cave hibernator
Virginia Northern Flying Squirrel	X	X*				* Protection of spruce
Peregrine Falcon	X	X*		X		* Needs isolated cliffs
Bald Eagle	X	X*		X		* Needs forested riparian
James Spinymussel	X	X*				* Sensitive to siltation
Shale Barren Rockcress	X					* Shale barrens
Swamp Pink	X	X*		NA		* Wetland inhabitant
Northeastern Bulrush	X	X*		NA		* Wetland inhabitant

STANDARDS

Because there is no designated critical habitat for any of the federally listed species, Paragraph 219.27(a)(7) is not relevant to the revision of the *Land and Resource Management Plan for the George Washington National Forest.* Viable populations of threatened and endangered species are ensured through a combination of monitoring the populations and the incoroporation of standards in the Revised Plan. The standards from the *Final Environmental Impact Statement — Vegetation Management in the Appalachian Mountains* have been somewhat modified to reflect the situation on the George Washington National Forest. These modifications are consistent with the direction in the Record of Decision (page A-6) in that the modifications make the requirements more, not less, restrictive. The following standards are required to achieve the management requirement, under §§219 27(a)(6), of ensuring adequate habitat to maintain viable populations of threatened and endangered species as management indicator species:

General

- A Biological Assessment (BA) is done as part of a site-specific environmental analysis to determine how a project affects federally isted (endangered and threatened) and federally proposed species A Biological Evaluation (BE) is done as part of a site specific environmental anaysis to determine if and how a project affects those species designated as sensitive by the Regional Forester.

This assessment and/or evaluation considers all available inventories of threatened, endangered, and sensitive species occurences and suitable habitat in the poject area. When adequate inventory information is unavailable, it is to be obtained by on-site field surveys when the site has high potential for occupancy by a threatened, endangered, or sensitive species. [Revised Plan Standard 240.]

- If, either with or without informal consultation with the Fish and Wildlife Service, it is determined that a proposed project would not affect federal designated threatened or endangered species, the concurrence of the FWS is not required. If it is determined that a proposed project would have beneficial, insignificant or discountable effects to federal designated threatened or endangered species (the "not likely to adversely affect" determination under the Endangered Species Act), the concurrence of the FWS is required prior to making a project decision If it is determined that a proposed project would have adverse effects to federal designated threatened or endangered species (the "may effect" determination under the ESA), formal consultation should be initiated and completed with the FWS prior to any decision to implement the project. [Revised Plan Standard 242.]

- If it is determined that a project may have adverse effects to individual of a sensitive species, evaluate whether the overall species' survival or population viability on the planning unit, are at risk. Contact appropriate State agencies, Natural Heritage Programs, and other appropriate cooperators or species authorities to identify conservation measures that might be implemented. On the Forest it is recognized that individuals of a sensitive species may be affected but the goal is to prevent negative population trends that would result in Federal listing [Revised Plan Standard 243.]

Northern Flying Squirrel

- Stands that contain a red spruce component are managed to increase the red spruce component. In such an instance, the activities must comply with the recovery plan for the Virginia Northern flying squirrel. [Revised Plan Standard 244]

Bald Eagle

- Eagle nests are protected from distrubance with a minimum of a 1/2 mile buffer restricting management activity. Refer to the recovery plan for eagle for the specifics on the management in the 1/2 mile buffer. [Revised Plan Standard 246.]

Threatened, Endangered or Sensitive Plants

- No herbicide is aerially applied within 300 feet, nor ground-applied within 60 feet, of any known threatened, endangered, proposed, or sensitive plant. Buffers are clearly marked before treatment so applicators can easily see and avoid them. [Revised Plan Standard 118.]

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APPENDIX K
BIOLOGICAL ASSESSMENT FOR ENDANGERED, THREATENED, PROPOSED SPECIES
BIOLOGICAL EVALUATION FOR SENSITIVE SPECIES

SUMMARY

The George Washington National Forest is revising its Forest Land and Resource Management Plan (Plan) This revised Plan will guide the management of the Forest for the next 10 to 15 years. The Plan will provide programmatic direction for the George Washington National Forest (Forest) in support of multiple use goals, objectives, and standards The programmatic direction is not site specific. This Biological Assessment documents Federal listed Proposed, Threatened, and Endangered plant and animal species species that occur or could occur on the Forest and provides a determination of effect at the programmatic level Project specific analyses will determine site specific effects at the time of a project proposal and will tier to this programmatic Biological Assessment (BA). Seven animal and three plant species which are presently listed occur or could occur on the Forest . The objectives of this BA are to: 1) document the occurrence or likelihood of occurrence of Federally proposed and listed species, 2) determine effects of proposed activities on the Species at the programmatic level, and 3) determine recovery objectives for the Species. Potential effects of management activities identified in the Plan are evaluated. Determinations of effect by species are made based upon best available information and the provision that a project-specific biological assessment (BA) or biological evaluation (BE) is accomplished. In assessing the potential effects of management activities, species are grouped into similar habitats and/or similarity of effects on the species. As new information becomes available through inventory and research, a revision of this assessments' recommendations through formal and informal consultation with the Fish and Wildlife Service (FWS) will be implemented.

PROPOSED ACTION

The Forest proposes to revise the Plan to provide programmatic direction in support of multiple use goals, objectives, and standards Proposed actions could include, but are not limited to, timber harvest, road construction, reconstruction, management, and maintenance; prescribed burning, erosion control; fish habitat improvement; wildlife habitat improvement; mineral development; utility corridor maintenance and construction; pesticide use; recreational facilities construction, management, and maintenance and dispersed recreation use management Refer to the Revised Plan and Final Environmental Impact Statement for detailed programmatic descriptions, proposed actions, and general effects of actions

Potential effects of the proposed actions could be detrimental or beneficial to the Species, depending upon individual Species' biology, habitat relationships, implementation measures, and mitigation. Specific timing and location of proposed actions that could mitigate or provide beneficial effects will be incorporated into alternatives of project-specific actions.

SPECIES EVALUATED

The Species considered for this Biological Assessment (BA) are included on the U. S. Department of Interior Fish and Wildlife Service Endangered and Threatened Species List.

This BA utilizes biological expertise and inventories available through the USDI Fish and Wildlife Service (FWS), Virginia Division of Natural Heritage (VDNH), Virginia Department of Game and Inland Fisheries

(VDGIF), West Virginia Natural Heritage Program (WVNHP), West Virginia Department of Natural Resources (WVDNR), and the USDA Forest Service (FS). Analysis to determine whether species occur or could occur on the Forest is continuous and subject to updating as additional inventories and studies are accomplished.

A list of Proposed, Endangered, Threatened, and Candidate C1 plant and animal species that occur or could occur on the Forest was first created by reviewing the National Wildlife and Fisheries Reporting System for Forest Plan Implementation information on the Forest and the Forest Threatened, Endangered, and Sensitive (TES) Plant and Animal Species List. Additional possibilities were gathered from "Virginia's Endangered Species" (Terwilliger 1991), "Endangered and Threatened Plants and Animals of Virginia" (Linzey 1979), "Natural Heritage Resources of Virginia: Rare Animals" (Pague 1992), "Natural Heritage Resources of Virginia: Rare Vascular Plant Species" (Ludwig 1992), and "State Element List Plants, Invertebrates, Vertebrates - West Virginia" (WVNHP 1992).

The Species list then contained Federal Endangered, Threatened, and Candidate C1 species listed between 1977 and March 1992 and was cross-checked against the August 29, 1992 edition of Endangered and Threatened Wildlife and Plants (USFWS), the February 21, 1990, Federal Register (Review of Plant Taxa for Listing), and the November 21, 1991, Federal Register (Animal Notice of Review) Any species occurring or likely to occur within GWNF that were listed in these additional sources were added to the list while species that did not appear in these sources were dropped from the list.

Virginia and West Virginia Natural Heritage Program element occurrence records, Virginia Department of Game and Inland Fisheries information, and contacts with public and private individuals with specific knowledge of the included plants and animals were used to determine if the species actually or potentially occurs near or within the Forest. Species populations that were documented in Virginia and West Virginia were then located on maps of the Forest and surrounding areas If a species was not documented to exist on the Forest, but occurred in nearby counties having similar habitat to the Forests' habitat, biologists and botanists in the various agencies were consulted as to the likelihood of occurrence on the Forest The biologists and botanists were also asked if they had any information regarding additional species occurrence on or near the Forest. Species with questionable documentation concerning exact areas of occurrence were inquired about through communication with Virginia and West Virginia NHPs, to determine the most recent inventory information.

As of December 1, 1992, the following species were determined to occur or could occur on the Forest.

Plant Species

Scientific Name	Common Name	Federal Status	Occurrence
Scirpus ancistrochaetus	Northeastern Bulrush	E	Occurs
Helonias bullata	Swamp Pink	T	Occurs
Arabis serotina	Shale Barren Rockcress	E	Occurs

Animal Species

Scientific Name	Common Name	Federal Status	Occurrence
Pleurobema collina	James Spinymussel	E	May Occur
Falco peregrinus anatum	American Peregrine Falcon	E	Occurs
Haliaeetus leucocephalus	Bald Eagle	E	Occurs
Felis concolor couguar	Eastern Cougar	E	May Occur
Glaucomys sabrinus fuscus	Virginia Northern Flying Squirrel	E	Occurs
Myotis sodalis	Indiana Bat	E	Occurs
Plecotus townsendii virginianus	Virginia Big-eared Bat	E	May Occur

Habitat relationships for the Species were determined to be:

Plant Species

Species	Habitat Relationships
Scirpus ancistrochaetus	Acidic to circumneutral natural ponds, shallow sinkholes or wet depressions (wet meadows and marshes) which are permanently inundated.
Helonias bullata	Sphagnous spring seeps, bogs, and wetlands
Arabis serotina	Shale barrens and adjacent thinly canopied oak-pine woodlands

Animal Species

Species Habitat Relationships	
Pleurobema collina	Medium to large coolwater streams with slow to moderate velocity and sand or cobble bottom substrate
Falco peregrinus anatum	Large vertical rock cliffs with ledges and wide-range of surrounding habitats with adequate bird prey populations
Haliaeetus leucocephalus	Riparian areas with large trees suitable for roosts and nests and adequate fish prey populations.
Felis concolor couguar	Originally wide-ranging using a variety of habitats which support adequate prey base of deer, small mammals, etc
Glaucomys sabrinus fuscus	Boreal habitats, especially mature red spruce and northern hardwood forests.
Myotis sodalis	Caves for hibernating in winter and perennial streams with mature overhanging trees in adjacent riparian area for foraging.
Plecotus townsendii virginiana	Caves for winter hibernating and summer roosting

Inventories for Threatened and Endangered (T&E) plant and animal species occurrences are in progress or will soon be initiated across the Forest. Surveys are being accomplished in cooperation with the Virginia

and West Virginia Natural Heritage Programs, VDGIF, and WVDNR. Site specific surveys are accomplished based upon probability of occurrence and risk to species at the project level.

POTENTIAL EFFECTS

The Plan places known occurrences of T&E species in management areas which recognize their unique biological features and provides Forestwide Standards specific to T&E species and caves. Information on historic and extant occurrences were provided by the WVNHP and VDNH. The VDNH prepared a Technical Report for the Forest titled, "Biological Diversity Protection on the George Washington National Forest, Site Reports for Proposed Research Natural Areas and Special Interest Areas" in December 1991 which details information on T&E species occurrences, boundary justification, and management considerations. The WVNHP supplied similar information for occurrences in West Virginia. This information formed the basis and became the Special Interest Areas-Biological which are recognized in the Plan. All T&E species populations and habitats are monitored for changes in habitat or population trends.

Plant Species

Scirpus ancistrochaetus - The Northeastern Bulrush could be adversely affected by any activity which directly affects the species, such as ORV/ATV use, or alters the hydrology of the wetland habitat which currently supports the species.

> Implementation Measures: Occurrences for this species on the Forest are in naturally occurring mountain ponds. All known occurrences are in Special Interest Areas-Biological and are protected from activities which may alter the hydrology. ORV/ATV use is restricted to designated routes in the Forest.

Helonias bullata - Swamp Pink could be adversely affected by any activity which directly affects the species, such as ORV/ATV use and trampling, or alters the hydrology of the wetland (sphagnous seeps and springs) habitat which currently supports the species.

> Implementation Measures: Spring seeps and bogs are identified as wetlands in the Plan. Riparian area standards provide for protection of these areas allowing only for management activities which will enhance riparian dependent resources. All known seeps and bogs which support the species are protected as Riparian Areas or Special Interest Areas-Biological. ORV/ATV use is restricted to designated routes in the Forest.

Arabis serotina - The Shale Barren Rockcress occurs in habitat not generally considered for proposed actions. The shale barrens and adjacent xeric woodlands may be adversely affected by activities such as road building, quarrying shale for building material, trail construction, and some timber activities.

> Implementation Measures: Continue to inventory for this species. All known occurrences are protected in Special Interest Areas-Biological. Any activities which may affect shale barrens within the range of the species will be surveyed for possible occurrences and protection implemented if found.

Animal Species

Pleurobema collina - The James Spinymussel could be detrimentally affected by any proposed action which degrades water quality or increases turbidity and sedimentation in its aquatic habitat. Much of the species' biology remains unknown, but it likely feeds on detritus, diatoms, and phyto- and zooplankton

similar to that of other freshwater mussels. Reproduction is similar to that of other freshwater mussels. Seven fish, all in the family Cyprinidae (minnows), have been identified as suitable hosts for *P. collina* glochida.

Implementation Measures: Many historic and currently known occurrences and suitable habitats are located downstream of Forest land. Application of riparian area and soil and water standards and guidelines will protect downstream aquatic habitats. Projects in riparian areas which occur within or near occupied or suitable habitat will be addressed with site specific measures, and pre- and post-work monitoring. A population monitoring program, life history study, and threat analysis are ongoing.

Falco peregrinus anatum - This species was extirpated from the region but since 1988 59 birds have been hacked on the Forest as part of a reintroduction program. To date no pairs are known to have nested on the Forest although individual birds have been seen. The Peregrine Falcon could be detrimentally affected by disturbance of its large cliff nesting sites during courtship, nesting, and fledging periods. This disturbance is generally related to recreational activities such as rock climbing, hang gliding, hiking, or facilities development in immediate proximity to nest sites. Pesticide use in winter habitats could be of concern. Illegal shooting has not been a problem locally, but may be a factor during migration to winter habitats.

Implementation Measures: Expand existing monitoring program to include additional ground observations and aerial surveys to determine location of possible nest sites on the Forest.

Haliaeetus leucocephalus - The Bald Eagle could be detrimentally affected by disturbance of its riparian area roosts and nesting sites during courtship, incubation, and fledging periods. This disturbance is generally related to recreational activities such as boating, camping, hiking, or facilities development in immediate proximity to roosts and nest sites. Pesticide use in winter habitats could be of concern. Illegal shooting has not been a problem on the Forest, but may be a factor during migration to winter habitats.

Implementation Measures: Continued protection of roosts and nest sites along with an expanded monitoring program to determine location of roosts and nest sites. Intensify monitoring efforts at known nesting area. Standards insure protection and freedom from disturbance. Information and education efforts with the public is required. Assist with law enforcement efforts to protect eagles.

Felis concolor couguar - The Eastern Cougar has not been documented on the Forest since approximately 1940. Deer populations on the Forest may possibly support a small eastern cougar population. Forest management activities which provide habitat for prey species such as deer and small mammals and which are dispersed and at low intensities would probably benefit the species. Road closures may be necessary to limit human access associated with high hunting intensities, dog hunting, and disturbance caused by motorized vehicles.

Implementation Measures: Continue efforts and coordination with appropriate state agencies to determine whether the cougar exists on the Forest.

Glaucomys sabrinus fuscus - The Virginia Northern Flying Squirrel requires mature forest conditions in red spruce/northern hardwood communities. While the species could be adversely affected by activities that eliminates cavities or alters the forest community the species depends upon, it might also be adversely affected if the essentially even-aged forest communities are not managed such that a continuous, stable progression of age classes provides necessary habitat. Commitments of suitable habitat to alternate land uses, such as road corridors, mineral development, or other multiple uses, would be detrimental.

Implementation Measures: Provide for management of habitats to ensure a stable resource through time. The single known occurrence on the Forest is protected with Standards specific for protection and management of the forested area. Continue present efforts and coordinate with the FWS and VDGIF to survey occupied and suitable habitat. Protect occupied and suitable recovery habitat from commitment to alternate uses which would result in net habitat loss.

Myotis sodalis - On the Forest the Indiana Bat uses summer foraging habitat along riparian corridors and caves suitable for hibernation. Timber harvest or proposed actions which could alter the forest conditions around cave entrances or the mature tree canopy overhanging perennial streams would adversely affect the species. Widespread use of broad base insecticides to control gypsy moths that affect insect populations may affect the species. Gradual aging of riparian areas and the large portion of the Forest in unsuitable management areas and designated as old growth will benefit the species.

Implementation Measures: Standards providing for cave management and the management of riparian areas for riparian dependent resources will help support the species. The cave entrances and surrounding 900 acres of the only known hibernacula on the Forest are managed as a Special Interest Area-Biological. Gates to eliminate possible disturbance to the species during hibernation will be installed, if necessary, after review by appropriate agencies. Continue inventory and monitoring to determine foraging habitat and areas used. Wide spectrum insecticides which may affect insect populations will not be used in the general forest area where Indiana Bats may occur.

Plecotus townsendii virginianus - The Virginia Big-eared Bat would be adversely affected by human disturbance during hibernation or roosting, or the alteration of forest vegetation around cave entrances and foraging habitat or conditions within the cave. Widespread use of insecticides to control gypsy moths which affect the moths on which the species feeds may affect the bat.

Implementation Measures: Caves are identified as special habitats across the Forest. Standards specific to caves are provided for management. Caves are searched for and the resources they support inventoried. Those which contain biological resources receive the greatest level of protection. No known occurrences for this species are presently located on the Forest. Wide spectrum insecticides will not be used in the general forest area where the bats may occur.

RECOVERY OBJECTIVES

Recovery Plans have been developed for each of the ten species listed above. Nine Recovery Plans have been finalized and one, Northeastern Bulrush, is in Technical/Agency Draft form. Each Plan contains species specific guidelines for recovery and a schedule for implementation. The Forest will implement all recovery tasks identified for the U.S. Forest Service or specifically the George Washington National Forest. Recovery Plans are available from the FWS and are on file at the Supervisor's Office of the Forest.

DETERMINATION OF EFFECT

Based upon the above implementation measures that would be applied within appropriate habitats for each species, Plan standards, existing and continuing inventories, and site-specific review for T&E species at the project level, the proposed actions of the Revised Forest Land Management Plan for the George Washington National Forest will not adversely affect any Federal listed Proposed, Endangered, or Threatened species. Beneficial effects may result from implementation of recovery objectives specified for the Forest as provided in Recovery Plans for each species. This determination of effect is rendered only on the basis of additional project-level site specific analysis and BA documentation, consultation with the FWS as prescribed by the Endangered Species Act, and subsequent determination of effect for all proposed projects.

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SUMMARY

The George Washington National Forest is revising its Forest Land and Resource Management Plan (Plan) This revised Plan will provide revised programmatic direction for the George Washington National Forest (Forest) in support of multiple use goals, objectives, and standards. The programmatic direction is not site specific. This Biological Evaluation (BE) documents effects to sensitive plant and animal species at the programmatic level as the result of implementing the revised Plan. Species included on the sensitive species list include those listed by Virginia as threatened and endangered under state statutes; those species ranked by The Nature Conservancy and Virginia and West Virginia Natural Heritage Programs as G1, G2, S1, and S2; and species for which there are concerns over maintaining viable populations on the Forest. Project specific analyses will determine site specific effects at the time of project proposal and will tier to this programmatic BE. Eighty-seven animal and 156 plant sensitive species occur or could occur on the Forest. The objectives of this BE are to: 1) document the occurrence or likelihood of occurrence of sensitive species recommended for inclusion on the Regional Forester's list, 2) determine effects of proposed activities on the species at the programmatic level, and 3) determine a strategy for conservation of the species. Potential effects of management activities identified in the Plan are evaluated. Determinations of effect by species are made based upon best available information and the provision that a BE will be prepared which is project-specific at the time of project analysis. In assessing the potential effects of management activities, species are grouped into similar habitats and/or similarity of effects on the species. The sensitive species list is dynamic and may change often as new information becomes available. As changes occur, the list will be updated. As new information becomes available through inventory and research, a revision of this BE's recommendations will also be accomplished.

PROPOSED ACTION

The Forest proposes to revise the Plan to provide programmatic direction in support of multiple use goals, objectives, and standards. Proposed actions could include, but are not limited to, timber harvest; road construction, reconstruction, management, and maintenance; prescribed burning; erosion control; fish habitat improvement; wildlife habitat improvement; mineral development; utility corridor maintenance and construction; pesticide use; and recreational facilities construction, management, and maintenance and dispersed recreation use management. Refer to the Plan and Final Environmental Impact Statement (EIS) for detailed programmatic descriptions, proposed actions, and general effects of actions.

Potential effects of the proposed actions could be detrimental or beneficial to the species, depending upon individual species' biology, habitat relationships, implementation measures, and mitigation. Specific timing and location of proposed actions that could mitigate or provide beneficial effects will be incorporated into alternatives of project-specific actions.

SPECIES EVALUATED

Sensitive species are those plant and animal species identified by the Regional Forester for which population viability is a concern as evidenced by: 1) significant current or predicted downward trends in population numbers or density, and 2) significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution. The species included in this BE are those recommended by the Forest to the Regional Forester. These species are listed in Appendix F of the EIS and Appendix I of the Plan with information on rank, legal status, occurrence by Ranger District, habitat, and Management Area of occurrence(s).

Based upon the best available information and review and consensus by cooperating agencies and species authorities, there are 87 animal and 156 plant sensitive species. A summary of these species is as follows:

Sensitive Species Summary

Animals		Plants	
29	Invertebrates	156	Vascular Plants
7	Mollusks		
3	Fishes		
2	Amphibians		
6	Reptiles		
24	Birds		
16	Mammals		

This BE utilizes biological expertise and inventories available through the USDI Fish and Wildlife Service (FWS), Virginia Division of Natural Heritage (VDNH), Virginia Department of Game and Inland Fisheries (VDGIF), West Virginia Natural Heritage Program (WVNHP), West Virginia Department of Natural Resources (WVDNR), and the USDA Forest Service (FS) Analysis to determine species that occur or could occur on the Forest is constant and subject to updating as additional inventories and studies are accomplished. The sources of information for species considered in this BE are noted above.

Inventories for additional sensitive plant and animal species occurrences are in progress or will soon be initiated across the Forest. Surveys for various species and in various areas of the Forest are underway in cooperation with the VDNH, WVNHP, VDGIF, WVDNR, and various species authorities. The Appalachian Trail corridor on the Pedlar Ranger District is currently being surveyed with completion scheduled in 1993. Site specific surveys are accomplished based upon probability of occurrence and risk to species at the project level.

POTENTIAL EFFECTS

The Plan places known occurrences of sensitive species in management areas which recognize their unique biological features and provides Forestwide Standards specific to sensitive species and caves. Information on historic and extant occurrences were provided by the WVNHP and VDNH. The VDNH prepared a Technical Report for the Forest titled, "Biological Diversity Protection on the George Washington National Forest, Site Reports for Proposed Research Natural Areas and Special Interest Areas" in December 1991 which details information on T&E species occurrences, boundary justification, and management considerations. The WVNHP supplied similar information for occurrences in West Virginia. This information formed the basis and became the Special Interest Areas-Biological which are recognized in the Plan. Implementation schedules with appropriate species or habitat monitoring will be prepared for the management of each Special Interest Area-Biological.

Specific potential effects on each of the 243 sensitive species will be determined at the project level. Site-specific effects analysis will be accomplished for each project. Cumulative effects are analyzed any time a potential adverse effect in the analysis process or "may affect" determination occurs. If impacts cannot be avoided, the significance of potential adverse effects on the population or its habitat within the area of concern and on the species as a whole is determined. (The line officer, with project approval authority, makes the decision to allow or disallow impact, but the decision must not result in loss of species viability or create significant trends toward Federal listing).

Effects by Habitat Associations

1. Species associated with Aquatic and Riparian Habitats (including all Wetlands and Ponds) - These species could be adversely affected by any proposed action which degrades water quality, especially clean silt-free stream substrates needed for reproduction, and use of pesticides near or over open water. Species associated with wetlands could be adversely affected by any proposed action which results in changes in hydrology of the area or direct effects such as trampling and uprooting.

> Implementation Measures: Application of riparian area and soil and water standards will lessen or eliminate impacts to aquatic habitats and riparian areas. Road construction and maintenance which requires stream crossings, trail construction which is in riparian areas or requires stream crossings, fish habitat improvements, and wildlife habitat improvements in riparian areas which occur within or near occupied or suitable habitat must be addressed with site specific analysis Pesticide use is limited near open water and emphasis is placed on Integrated Pest Management Forestwide. ORV/ATV use is restricted to designated routes on the Forest.

2. Species associated with Dry Woodland, Glade, Shale Barren and Rock Outcrop Habitats - These species could be adversely affected by proposed actions which directly alter the physical, vegetative, or hydrological characteristics of the habitats. Some species (especially butterflies) may be adversely affected by the use of insecticides near these habitats. Additional effects associated with changed or increased recreational activities could occur.

> Implementation Measures: These are special habitats recognized as supporting many of the endemic and unique species on the Forest. Pesticide use is limited near this habitat and emphasis is placed on Integrated Pest Management Forestwide. Standards concerning mineral development, road construction, and recreation development, plus site specific analysis would prevent the loss of species viability for those species occurring on these habitats.

3. Species associated with Cave and Karst Habitats - Those species associated with caves could be adversely affected by proposed actions which disturb or alter the physical characteristics of cave entrances and interiors or alters the quality and hydrology of waters flowing thru or in caves. Species may also be adversely affected by recreation use or vandalism which disturbs or tramples cave biota.

> Implementation Measures: These special habitats are recognized as important components in providing biodiversity on the Forest and in the region. Standards specific to all caves and surrounding lands are recognized Forestwide.

4. Species associated with Mesic Woodland Habitats (includes all other forested communities) - Species associated with various forest types or forest conditions (old growth or recently burned) may be either beneficially or adversely affected by any proposed activity depending upon the degree and nature of disturbance.

> Implementation Measures: These habitats are recognized as necessary to provide biodiversity and support viable populations of all plants and animals across the Forests. Standards and guidelines and site specific analysis would prevent the loss of species viability for any sensitive species wherever it occurs.

STRATEGY FOR CONSERVATION

Document occurrences of sensitive species in communities and special habitats that could be affected by activities during implementation of the Plan through site-specific analysis. Continue on-going inventories with the Virginia and West Virginia Natural Heritage Programs and species authorities, site specific inventories in support of proposed projects as necessary, and development of the Forest TES species program within The Nature Conservancy's Biological and and Conservation Database (BCD) system. Work with adjacent national forests, national parks, State agencies, and private landowners to develop conservation strategies for each species or group of species on a priority basis. Priority will be determined by concern for species viability. Insure that Forest proposed projects have a completed BE with analysis which documents occurrence or likelihood of occurrence of sensitive species, viability analysis anytime adverse effects are anticipated, and determination of effect. If impacts cannot be avoided, analyze the significance of potential adverse effects on the population or its habitat within the area of concern and on the species as a whole. (The line officer, with project approval authority, makes the decision to allow or disallow impact, but the decision must not result in loss of species viability or create significant trends toward Federal listing.)

DETERMINATION OF EFFECT

Based upon conservation strategies, habitat relationships, Plan standards, existing continuing inventories, and site-specific BE analysis at the project level, there will be no effect that significantly affects viability or results in Federally-listing of any sensitive species. There will be beneficial effects on sensitive species with the implementation of some proposed management techniques. This determination of effect is rendered only on the basis of additional project-level site-specific analysis and BE documentation, continuing inventories and determination of specific habitat relationships, viability analysis as necessary, and subsequent determination of effect for proposed projects resulting from implementation of the revised Plan.

Prepared By:

December 16, 1992
Date

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Reviewed By:

December 16, 1992
Date

/s/ Scott R. Klinger
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December 12, 1992
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December 16, 1992
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Staff Officer
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United States Department of the Interior

FISH AND WILDLIFE SERVICE
DIVISION OF ECOLOGICAL SERVICES
1825 VIRGINIA STREET
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December 24, 1992

Mr. George W. Kelley
Forest Supervisor
George Washington National Forest
Harrison Plaza
P.O. Box 233
Harrisonburg, VA 22801

RE: Comments on Endangered Species Biological Assessment on Revised Forest Plan

Dear Mr. Kelley:

This responds to your letter of December 15, 1992, transmitting the Biological Assessment for management of endangered and threatened species on the George Washington National Forest, in association with your revised Forest Management Plan. We have reviewed the biological assessment as well as relevant portions of the revised Plan, and we concur with your conclusions that implementation of the Plan will not adversely affect any endangered, threatened or proposed species, and may result in beneficial effects to these species. We commend you and your staff for preparation of a far-reaching and insightful Forest Plan revision. Although necessarily written in generalized terms due to its programmatic nature, this document is exemplary in providing protection and informed management of the rare species and habitats that occur on the Forest.

If you require further information from our office on the Biological Assessment or rare species management on the Forest, please contact Judy Jacobs of our endangered species staff, telephone (410) 269-5448. We are pleased to cooperate with you on this project, and we look forward to our further cooperation in completing the pre-listing recovery plan for the Cow Knob salamander in the near future.

Sincerely,

ACTING Edward C. Sundlitz

John P. Wolflin
Administrator
Chesapeake Bay Field Office

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UNPUBLISHED PROCESS PAPERS

The following papers are unpublished process papers written by the Forest's Id Team. They are available for viewing at the Forest Supervisor's Office in the Harrison Plaza, Harrisonburg.

Addressing Issues and Concerns in the Revision of the Land and Resource Management Plan for the George Washington National Forest

Alternative #1 for Consideration in the Revision of the Land and Resource Management Plan for the George Washington National Forest

Alternative #2 for Consideration in the Revision of the Land and Resource Management Plan for the George Washington National Forest

Alternative #3 for Consideration in the Revision of the Land and Resource Management Plan for the George Washington National Forest

Alternative #4 for Consideration in the Revision of the Land and Resource Management Plan for the George Washington National Forest

Alternative #5 for Consideration in the Revision of the Land and Resource Management Plan for the George Washington National Forest

Alternative #6 for Consideration in the Revision of the Land and Resource Management Plan for the George Washington National Forest

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Alternative #10 for Consideration in the Revision of the Land and Resource Management Plan for the George Washington National Forest

Alternative #11 for Consideration in the Revision of the Land and Resource Management Plan for the George Washington National Forest

Alternative #12 for Consideration in the Revision of the Land and Resource Management Plan for the George Washington National Forest

Alternative #13 for Consideration in the Revision of the Land and Resource Management Plan for the George Washington National Forest

Alternative #14 for Consideration in the Revision of the Land and Resource Management Plan for the George Washington National Forest

An Analysis of the Potential Geographic Impacts of Volume Changes in Timber Harvest on the George Washington National Forest Market Area

Determining Developed Recreation Demand on the George Washington National Forest

Determining Wilderness Demand on the George Washington National Forest

Dispersed Recreation Demand Analysis – George Washington National Forest

Economic Diversity and Dependency Assessment

Effects of Commercial Clearcutting on Nutrient Losses in Appalachian Forests

Incorporation of the NFMA Consistency Requirements into the Revision of the Land and Resource Management Plan for the George Washington National Forest

Incorporation of the NFMA Requirements for Conserving Soil and Water Resources and Not Allowing Significant or Permanent Impairment of the Productivity of the Land into the Revision of the Land and Resource Management Plan for the George Washington National Forest

Incorporation of the NFMA Requirements for Even-Aged Management into the Revision of the Land and Resource Management Plan for the George Washington National Forest

Incorporation of the NFMA Requirements for Grazing Resource into the Revision of the Land and Resource Management Plan for the George Washington National Forest

Incorporation of the NFMA Requirements for Minimizing Serious or Long Lasting Hazards into the Revision of the Land and Resource Management Plan for the George Washington National Forest

Incorporation of the NFMA Requirements for Off-Road Vehicle Use into the Revision of the Land and Resource Management Plan for the George Washington National Forest

Incorporation of the NFMA Requirements for Riparian Areas and Water Bodies into the Revision of the Land and Resource Management Plan for the George Washington National Forest

Incorporation of the NFMA Requirements for Roadless Area Evaluation and Wilderness Management into the Revision of the Land and Resource Management Plan for the George Washington National Forest

Incorporation of the NFMA Requirements for Silvicultural Practices into the Revision of the Land and Resource Management Plan for the George Washington National Forest

Incorporation of the NFMA Requirements for Timber Resource Land Suitability into the Revision of the Land and Resource Management Plan for the George Washington National Forest

Incorporation of the NFMA Requirements for Transportation and Utility Corridors into the Revision of the Land and Resource Management Plan for the George Washington National Forest

Incorporation of the NFMA Requirements for Vegetation Manipulation into the Revision of the Land and Resource Management Plan for the George Washington National Forest

Issue Identification—Revision of the Land and Resource Management Plan for the George Washington National Forest

Issues to be Addressed in the Revision of the Land and Resource Management Plan for the George Washington National Forest

Management Requirements

Placing a Value on Water Yields from the George Washington National Forest

Roadless Area Allocation by Management Area

The Concept of Demand

Timber Supply and Demand Analysis for the George Washington National Forest

Water Supply Summary For Virginia

Wildlife and Fish Demand for the George Washington N.F.

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GLOSSARY

ASQ -- *see allowable sale quantity*

ATV -- see all-terrain vehicle

BLM -- see Bureau of Land Management

BMPs -- *see best management practices*

CEQ -- see Council on Environmental Quality

CFR -- see Code of Federal Regulations

DBH -- *see diameter breast height*

DEIS -- see draft environmental impact statement

DFC -- see desired future condition

FDR -- *see forest development road*

FEIS -- see final environmental impact statement

FORPLAN -- see Forest Planning

FSH -- *Forest Service Handbook*

FSM -- Forest Service Manual

FUD -- see fish-user days

IMPLAN -- *see Impact Analysis for Planning*

LWD -- see large woody debris

M -- Roman numeral for 1,000

MBF -- *thousand board feet*

MRVD -- see motorized recreation visitor days

NEPA -- National Environmental Policy Act

NFMA -- *National Forest Management Act*

NPV -- see nucleopolyhedrosis virus

OHV -- see off-highway vehicle

ORV -- *see off-road vehicle*

PNV -- see present net value

PPM -- parts per million

ROS -- *see recreation opportunity spectrum*

RM -- *see roaded modified*

RN -- see roaded natural

RVD -- see recreation visitor days

SPM -- *see semi-primitive, motorized*

SPNM -- see semi-primitive, nonmotorized

TSI -- see timber stand improvement

TSL - *see traffic service level*

VQO -- see visual quality objective

WSI -- see wildlife stand improvement

WUD -- *see wildlife user days*

access -- *the mode of travel available within an area* Access into roadless areas is typically provided for hikers, horseback riders, and, in some cases, mountain bikers Access *with motorized vehicles -- a prominent issue in the planning* process -- is not provided in roadless areas

administrative purposes -- *includes any management activity* by Forest Service personnel or management activity by others who are authorized or permitted by the Forest Service *Access for "administrative use only" is controlled with* gates

advance reproduction/advance regeneration -- *true* seedlings or sprouts of the tree species that occupy the overstory, existing as part of the understory vegetation The *root systems of sprout-advance-reproduction are usually* older than the stems, are relatively large, and are capable of supporting much greater stem growth than the root systems *of true seedlings*

age class -- one of the intervals into which the age-range of *trees is divided for classification or use*

allowable sale quantity (ASQ) -- the quantity of Forest *timber that may be sold during a time-period specified by* the Forest Plan. This quantity is usually expressed on an annual basis as the average allowable sale quantity The *ASQ includes only those volumes used in the yield projec*tion calculation of the sale schedule for suitable lands It may include salvage sale volumes, but only if included in *the yield projection calculations Volumes not included in* the calculation -- for instance, planned sales on lands classified as unsuitable for commercial timber production -- are not part of the ASQ

all-terrain vehicle (ATV) -- a type of off-highway vehicle (OHV) It includes vehicles 50 inches or less in width that have a dry weight of 600 pounds or less, that travel on three or more low-pressure tires and have a seat designed to be straddled by the operator Because all-terrain vehicles cannot be licensed or registered under state vehicle laws, they are not allowed on Forest Development Roads unless a road is specifically designated by Supervisor's Order for OHV use that includes ATVs

alternatives -- propositions or situations offering a choice of management plans, only one of which may be chosen.

arthropod -- invertebrate animals with jointed legs and a segmented body, such as insects, crustaceans, etc

area-sensitive species -- a term commonly applied to forest interior-nesting neotropical migrant bird species such as the worm-eating warbler Area-sensitive species nest in large blocks of forested land in North America and spend winters in Latin America or the Carribbean

artificial regeneration -- establishing a stand of trees by transplanting seedlings or by seeding

background -- the area located from approximately 3 to 5 miles to infinity from an observer The distant part of the "seen" landscape

basal area -- the basal area of a tree is the cross-sectional area of the bole stem at breast height The basal area of a stand is the sum of the basal areas of all trees, usually to a specified DBH, on a per acre basal If the specified DBH is the minimum merchantable diameter, then merchantable basal area is the result Basal area is used as a measure of stand density and an index of cubic volume of a stand It can be quickly and easily measured by means of prisms or angle gauges to determine volume and number of trees per acre

below-cost timber sales -- the expenses of administering and operating a timber sale exceed the revenues received from the sale of timber

benchmark -- An analysis reference point of the maximum physical/biological capability to produce a resource output from Forest lands while maintaining minimum legal requirements for production of other resources and maintenance of soil and water productivity Benchmarks define the area (i e , provide the bounds) within which alternatives can be formulated

best management practices (BMPs) -- a practice or combination of practices that is determined to be the most effective and practical means of preventing or reducing the amount of pollution generated by nonpoint sources to a level compatible with water quality goals.

board foot -- a unit of timber measurement that equals the amount of wood contained in an unfinished board one-inch thick, 12 inches long, and 12 inches wide

board foot/cubic foot conversion ratio -- the number of board feet per cubic foot of volume varies with tree species, diameter, height, and form factors For the GWNF, the Forestwide average conversion ratio is 6 98 board feet per cubic foot

biological diversity -- the distribution and abundance of different plant and animal communities and species over time and space

browse -- leaf and twig growth of shrubs, woody vines and trees that are available for wildlife food

Bureau of Land Management -- federal agency within the Department of Interior which Congress has authorized to manage minerals on federal lands

cavity nester -- wildlife species that excavate and/or occupy cavities in trees and snags

clearcutting -- a cutting method that removes all merchantable trees at one time and provides for regeneration from (a) the natural seeding of adjacent trees, (b) seed contained in slash, logging debris, or forest floor, (c) advance reproduction, (d) direct planting or seeding

Code of Federal Regulations -- general and permanent rules published in the federal register by executive departments and agencies of the federal government The Code is divided into 50 titles that represent broad areas subject to federal regulations

corridor -- a narrow strip of land usually for wildlife travelways or utility and transportation rights-of-way

Council on Environmental Quality -- an advisory council to the President It was established by the National Environmental Policy Act of 1969 The council reviews federal programs for effect on the environment, conducts environmental studies, and advises the President on environmental matters

cover type/forest type -- descriptive classification of forest land based on present occupancy of an area by tree species

crown class -- crowns of trees in the overstory are divided into four categories based on their position in the canopy The positions are classed from highest to lowest as dominant, co-dominant, intermediate, suppressed

cumulative effects -- the effect on the environment which results from the incremental effect of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions

cutting cycle -- the planned lapse of time between cuttings in a timber stand

demand -- the amount of goods or services that users are willing to take at a specified price, time period, and condition of sale

desired future condition -- the expected physical and biological condition of the Forest after specific management practices are applied for 10 years, 50 years, or longer as appropriate In selecting the management practices to be applied, guidelines are set by Forest Service policies, federal and state laws and regulations, and by Forest Service responses to issues/comments from the public

developed recreation -- recreation that requires facilities and results in concentrated use of an area. Examples are campgrounds and picnic areas

diameter breast height (DBH) -- the point, approximately 4-1/2 feet above the ground, at which the diameter of a tree is measured

direct effects -- effects which are caused by an action taken and occur at the same time and place as the action

dispersed recreation -- recreation outside of developed recreation facilities Examples are fishing, hiking, hunting, and driving for pleasure

draft environmental impact statement (DEIS) -- document that states the estimated environmental effects of major federal actions Is required by Section 102 of the National Environmental Policy Act and is released to the public and agencies for review and comment.

early forest succession -- the biotic community that develops immediately following major disturbance to the overstory

economic efficiency -- the point of operation where the net benefit is maximized Output levels are not pre-determined

ecosystem -- the complete system formed by the interaction of a group of organisms and their environment

edaphic -- pertaining to the soil

endangered species -- any species which is in danger of extinction throughout all or a significant portion of its range (Endangered Species Act of 1973)

endemic species -- a species whose natural occurrence is confined to a certain region and whose distribution is relatively limited

entisols -- recent soils that show little evidence of the factors of soil formation, common in alluvial areas and on steep slopes Refer to *Soil Taxonomy* (1975) for a more complete definition.

environmental impact statement (EIS) -- document that outlines the effects that a proposed project or management action will have on the environment An EIS will appear in both draft and final form When in the draft form, it is open to public review and comment

even-aged management -- timber cutting methods that produce stands made up of trees of essentially the same age Managed even-aged forests have a distribution of stands of varying ages and tree sizes throughout the forest area The difference in ages among trees forming the main canopy level of a stand usually does not exceed 20 percent of the age of the stand when ready for cutting. Regeneration in a stand is accomplished during a short period when the trees have reached the desired age or size for regeneration and the stand is cut Clearcut, shelterwood, modified shelterwood, and seed tree cutting methods produce even-aged stands

facultative plant -- usually found in wetlands (67%-99% frequency), but occasionally found in nonwetlands

final environmental impact statement (FEIS) -- the document that follows a draft environmental impact statement and contains analysis regarding forest programs that will have a significant impact on the environment

fire intensity -- one dimension of fire behavior which is used to stratify historic and potential fires for purposes of estimating probable fire suppression requirements and fire effects on resources The measure of fire intensity is flame length Fire intensity level I are fires with a flame height of 0-2 feet, intensity level II are fires with a flame height of 2-4 feet, and intensity level III are fires with a flame height of 4 feet

fish-user days (FUD) -- a unit used to measure the amount of use the public gets from the Forest A fish-user day represents one person fishing for a period of 12 hours

foreground -- the area within approximately 0 to 1/4 to 1/2 mile from the observer in which details of the landscape are visible

forest -- a collection of stands administered as an integrated unit Also, an ecosystem characterized by more or less dense and extensive tree cover

forest development road (FDR) -- a forest road under the jurisdiction of the Forest Service These roads are not public roads FDR roads are also referred to as a forest system road

forest type, cover type, stand type -- a category of forest defined by its vegetation, usually its composition and environmental factors

Forest Planning (FORPLAN) -- a linear programming model used to facilitate analysis of the alternatives

four-wheel drive vehicles -- A type of OHV that includes pickup trucks, jeeps, land rovers, or similar vehicles which are designed to negotiate rough and irregular road surfaces not maintained for standard four-wheel passenger cars This is also a term applied to high clearance vehicles. These vehicles accommodate more than one person, are ridden in as opposed to ridden on, and have a steering wheel rather than handlebars They are licensed by the states and are allowed on any Forest Development Roads that are open for public travel provided the vehicle and the operator are in compliance with motor vehicle laws of the state

full-service -- refers to recreation facilities that are maintained in top condition Water is available, toilets and bathhouses are routinely cleaned, trash is picked up rather than a pack-it-in, pack-it-out policy.

group selection cut -- the removal of trees in small groups of a few to many trees, usually creating openings of less than one acre in which regeneration can become established The objective is maintenance of trees of different ages and sizes intermingled in small groups

habitat capability -- a given area's potential wildlife population

impact analysis for planning (IMPLAN) -- a computer model for estimating income and employment effects

improvement cut -- cutting that adjusts species composition and tree quality in previously unmanaged stands that are older than the sapling stage

inceptisols -- recent soils that show beginning evidence of soil formation Generally the direction of soil development is not yet evident from the marks left by various soil forming processes Refer to *Soil Taxonomy* (1975) for a more complete definition.

indicator species -- the presence of a plant or animal that indicates that certain environmental conditions are also present

indirect effects -- the effects which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable.

inholding -- a parcel of non-federal land that is either totally surrounded by federally-owned land or where federally-owned land constitutes most of the adjoining property lines

instar -- any of the various stages of an insect or other anthropod between molts

interdisciplinary team -- a team representing several disciplines to insure coordination of the various resources Team functions include developing the Forest Plan, establishing the standards and requirements by which planning and management activities will be monitored and evaluated, and completing the annual evaluation report and recommending amendments

intermediate cut -- cuttings made to guide or modify development of existing trees, not to establish regeneration Includes thinning, release, removal, improvement, salvage, and sanitation cuts

intermittent stream -- a stream that flows seasonally in response to a fluctuating water table, with a scoured channel that is at least 3 feet wide

interpretation -- an activity that reveals meanings and relationships of the Forest's resources through the use of original objects, by firsthand experience, and by illustrative media Examples include watchable wildlife viewing areas and self-guided trails at abandoned iron furnaces

intolerant species -- plant species that do not grow well in shade

large woody debris (LWD) -- wood of a minimum length of 3 feet and minimum diameter of four inches LWD is an important component in forming pools and overhead cover for aquatic organisms LWD naturally provides self-sustaining habitat complexity and diversity.

late forest succession -- a stage of forest development where the majority of trees are mature or overmature

leasable minerals -- essentially all mineral resources, other than common variety minerals, which are available under the general leasing laws Includes oil, gas, coal, geothermal, metals, ores, and all valuable mineral resources

Level A -- a Traffic Service Level (TSL) classification which indicates that this road level is generally open year-round and can expect high volumes of traffic for all types of vehicles.

Level B -- a Traffic Service Level (TSL) classification which indicates that this road level is open year-round or closed seasonally and can expect moderate amounts of traffic during high use seasons

Level C -- a Traffic Service Level (TSL) classification which indicates that this road level will accommodate all traffic types, although the predominant use is usually administrative and commercial traffic Roads are designed for low volumes of traffic Some mixed use may have to be controlled to minimize conflicts, especially between public and commercial traffic

Level D -- a Traffic Service Level (TSL) classification which indicates that this road level is a low standard road built for a single purpose, usually commercial timber sales Once the primary purpose is served, these roads will be 1) closed to all traffic and seeded or 2) maintained for administrative use only

log rule -- rules, diagrams, or formulas used to estimate the board foot volume of logs The Forest uses the International Rule (1/4-inch saw kerf)

management area -- an area of the Forest with common management direction throughout Often, management areas contain several management prescriptions which set forth management practices and intensities for the area

management prescription -- management practices and intensities to be applied to a certain area of the Forest Used in combination with management areas

management team -- a decision-making group consisting of the forest supervisor, staff officers, and district rangers.

mast -- hard mast is the fruit or nuts of oak, beech, walnut, chinquapin, and hickory trees Soft mast includes the fruits and berries of dogwood, viburnums, elderberry, huckleberry, grape, raspberry, and blackberry

mature stands -- stands of trees are mature when the age of the stand is within or greater than the rotation age range for the working group and management area to which the stand belongs

middleground -- the area viewed which lies between approximately 1/4 to 1/2 mile to 3 to 5 miles from the observer.

million board feet (MMBF) -- standard measurement for timber volume M is the Roman numeral for 1,000, MM is equal to 1,000,000

mixed mesophysic forest -- a forest type that extends into the western parts of the GWNF on the Alleghany Plateau section, characterized by moist well-drained upland sites, best developed in the Cumberland Mountains

modification -- one of four categories in the Visual Quality Objective (VQO) system If the modification category is assigned to a portion of the Forest, man-caused changes to the landscape may be dominant in the view from travel routes or recreation areas

modified shelterwood -- The modified shelterwood system retains the same basic essence as the conventional shelterwood system -- the next stand of trees develops under the partial forest canopy left after a harvest of 80 to 85 basal area of merchantable trees About 15 to 25 basal area of midstory and overstory trees are left standing These trees cover a range of diameters but are usually 8 inches DBH or larger Yield from a modified shelterwood harvest is about 75 percent of the yield from a clearcut

Modified shelterwood relies on existing advance regeneration, stump sprouts, or seed stored in the forest duff The retained trees are not the focal source for stand regeneration. They do provide visual and wildlife habitat benefits. The retained trees provide a diverse, partial, high canopy There is an uneven, more-open canopy than with a conventional shelterwood cut The remaining trees allow about 80 percent of the current regeneration potential of clearcutting by limiting the sunlight that stimulates height-growth of existing advance regeneration, initiates stump sprouts, or germination of stored seed There is slower height-growth since retained trees compete with the new trees for available sunlight, nutrients, and soil moisture. Regeneration yields are about 10 percent less than clearcutting Some chainsaw site preparation of unmerchantable-size understory trees may occur to increase stump sprout potential.

Conventional shelterwood systems remove the retained overstory trees when the regenerated stand is adequately stocked In modified shelterwood, the retained overstory trees may be left standing, felled, or removed after stand regeneration reaches a suitable height.

mollisols -- soils with a thick, very dark-colored A (or upper) horizon.

monitoring and evaluation -- sample evaluation to determine how well Forest Plan objectives have been met on-the-ground and what the effects are on the environment

motorcycle -- a two-wheeled motor vehicle having handlebars and a saddle designed to be straddled Motorcycles may or may not be equipped to meet state licensing requirements

motorized recreation visitor days (MRVD) -- a unit for measuring motorized recreation activities that aggregates 12 visitor hours This may consist of one person for 12 hours, 12 persons for one hour, or any equivalent combination of continuous or intermittent recreation use by individuals or groups.

multiple-use management -- management of renewable surface resources of the national forests in a manner that best meets the needs of the American people

native species -- a plant or animal species that occurs indigenously in an area

naturalized species -- a non-native species established as if it were a native species

naturalness -- the degree of naturalness of the setting It affects the enjoyment of nature

neotropical migrants -- North American birds that migrate to the neotropics (South America, Central America, and Caribbean) during the winter but nest in North America

net public benefit -- overall value to the nation of all outputs and positive effects (benefits) less all associated inputs and negative effects (costs) whether they can be quantitatively valued or not. Net public benefits are measured by both quantitative and qualitative criteria.

no action alternative -- an alternative that mirrors current management direction with no changes

no surface occupancy stipulation -- a special stipulation attached to a federal oil and gas lease that prohibits use of the surface for any activities

nonpoint source pollution -- pollution with a source that is general rather than specific in origin

nucleopolyhedrosis virus -- A category of viruses In the context of the gypsy moth, a virus that is specific to it. It has been formulated and registered as an insecticide, Gypchek®

nutrient cycling -- a series of changes in chemical elements or inorganic compounds that are taken in by green plants and used in organic synthesis These changes usually lead back to the starting point via various pathways For example, nitrogen is used by a plant, liberated upon the death and decomposition of the plant, and converted to its original state of oxidation to be used again

obligate -- always found in wetlands under natural (not planted) conditions (frequency greater than 99%), but may persist in non-wetlands if planted there by man or in wetlands that have been drained, filled, or otherwise transformed into non-wetlands.

off-highway vehicle (OHV) -- broad category of motorized vehicles capable of off-highway travel This broad cateogry includes ATVs, motorcycles, trailbikes, and four-wheel drive vehicles ATVs and most trailbikes are not licensed under state motor vehicle laws Licensed OHVs are allowed on any Forest Development Road that is open for public travel provided the vehicle and the operator are in compliance with motor vehicle laws of the state This definition encompasses and replaces the term off-road vehicle (ORV)

off-road vehicle (ORV) -- the term off-road vehicle is encompassed by and replaced by the term off-highway vehicle (OHV)

partial retention -- one of four categories in the Visual Quality Objective (VQO) system When a VQO of partial retention is assigned to Forest land, management activities may be visible to casual observers along a travel route or from a recreation site. However, the views are carefully planned and do not detract from the landscape

perennial stream - a stream that flows year-round with a scoured channel that is always below the water table Includes streams in which flow is subsurface between pools that support fish

plan-level decision -- programmatic decisions which typically establish forestwide multiple-use goals and objectives, forestwide management requirements (standards), management areas and management area direction, lands classified as unsuitable for timber production, allowable sale quantity, monitoring and evaluation, and recommendations for wilderness These decisions are analogous to a zoning ordinance which divides an area into various zones and establishes standards for development by zone Activities may be permitted in a certain zone in conformance with the rules established for that zone, but a zoning ordinance itself does not require specific projects to occur It does mandate that all site-specific actions comply with the requirements in the zoning plan

population viability -- the degree to which a population can maintain itself over time, population viability analysis is the process by which this is estimated

preferred alternative -- the alternative recommended by the Forest Service for implementation as the Forest Plan

prescribed fire -- intentional application of fire, of either planned or unplanned ignitions, to accomplish planned objectives

present net value -- discounted benefits less discounted costs associated with outputs that can be assigned monetary values

preservation -- a category in the Visual Quality Objective (VQO) system. When a VQO of preservation is assigned to Forest land, no human-caused changes to the landscape are allowed except for low-level recreation developments to mitigate negative impacts caused by overuse of the resources The emphasis is on natural progression

primitive -- a classification of the Recreation Opportunity Spectrum (ROS) characterized by an essentially unmodified environment, where trails may be present but structures are rare, and where probability of isolation from the sights and sounds of man is extremely high

project-level decision -- decisions, such as building a hiking trail, constructing a campground, or making a timber sale, which apply to a specific site

pupa -- any insect in the non-feeding stage of development between the last larval and adult forms

radio quiet zone -- an area of approximately 13,000 square miles primarily in Virginia and West Virginia The zone -- established by the Federal Communications Commission and the National Telecommunications and Information Administration -- provides protection from fixed radio transmitters for the National Radiological Observatory at Greenbank, West Virginia, and the Naval Research Facility at Sugar Grove, West Virginia This protection is beyond the normal protection provided by the Frequency Allocation Process

recreation opportunity spectrum (ROS) -- a system for planning and managing Forest recreation that categorizes recreation as follows. primitive, semi-primitive motorized,

semi-primitive non-motorized, roaded natural, and roaded modified (See Appendix G for details)

recreation visitor days (RVD) -- a unit for measuring recreation activities that aggregates 12 visitor hours This may consist of one person for 12 hours, 12 persons for one hour, or any equivalent combination of continuous or intermittent recreation use by individuals or groups

regeneration -- the renewal of a tree crop by either natural or artificial means Also, the young crop itself.

release -- an intermediate cut that is used to regulate species composition or improve growth and quality of a young stand up to sapling size Also used to remove or control competing vegetation other than trees in order to improve forest stand development and growth, such as grapevine release.

remoteness -- refers to the extent to which individuals perceive themselves removed from the sights and sounds of human activity Within a roadless area, opportunities to experience a feeling of remoteness are relatively high

remote species -- a term most often used in relation to forest interior-nesting neotropical migrant birds such as some warblers, vireos, and thrush Remote species nest in large blocks of forested land in North America, spend winters in Central or South America

removal cut -- an intermediate cut that is used to remove the merchantable overstory from an unmanaged stand where desirable regeneration of seedlings/saplings have become established in the understory Also the final cut of a shelterwood cut

retention -- a category in the Visual Quality Objective (VQO) system When a VQO of retention is assigned to Forest land, the landscape is to remain relatively unaltered by human activity Most people visiting recreation sites or traveling along roads or trails within a retention area are not aware that management activities are occurring.

riparian areas -- composed of aquatic ecosystems (stream channels and lakes), riparian ecosystems (including 100-year flood plains), and wetlands

riparian dependent resources -- resources that owe their existence to the riparian area.

road density -- a measure of the total length of roads in a given size area It may be expressed in several different units One common measure is "miles per square mile"

roaded modified -- a Recreation Opportunity Spectrum (ROS) classification along Forest roads and highways where timber cutting activities may be readily visible in the form of clearcuts, skid roads and log landings This is not found along visually sensitive roads An ROS of roaded modified offers full access for all licensed motorized vehicles -- no challenge or risk expected, is generally natural in appearance although there is evidence of rustic structures, managerial control, and in comparison with other ROS classifications, the greatest evidence of timber cutting activities

roaded natural -- a Recreation Opportunity Spectrum (ROS) classification for lands along or near main Forest roads and highways with subtle modifications to the natural environment Improvements are limited to roads, trails and a few scattered structures The natural environment dominates, though some timber cutting may be visible An ROS of roaded natural offers full access for all licensed motorized vehicles with challenge and risk not expected, a generally natural appearance although there is evidence of rustic structures, managerial controls, and vegetation manipulation

road maintenance level -- the level of service provided by, and maintenance required for, a specific road, consistent with road management objectives and maintenance criteria Levels range from 1 (lowest) to 5 (highest)

roadless area -- if national forest lands meet one or more of the following criteria (defined in Chapter 7, FSH 1909 12), they qualify for placement on the inventory of roadless areas considered for wilderness designation

1 They contain 5,000 acres or more
2 They contain less than 5,000 acres but,
 a Due to physiography or vegetation, they are manageable in their natural condition
 b They are self-contained ecosystems such as an island
 c They are contiguous to existing wilderness, primitive areas, administration-endorsed wilderness, or roadless areas in other federal ownership, regardless of their size
3 They do not contain improved roads maintained for travel by standard passenger-type vehicles, except as permitted in areas east of the 100th meridian

Additional criteria apply to roadless areas east of the 100th meridian due to the fact that much, if not all of the land, shows some signs of human activity and modification

Roadless areas east of the 100th meridian qualify for inventory as potential wilderness (wilderness study area) if

1 The land is regaining a natural, untrammeled appearance
2. Improvements existing in the area are being affected by the forces of nature rather than humans and are disappearing or muted
3 The area has existing or attainable National Forest System ownership patterns, both surface and subsurface, that could ensure perpetuation of identified wilderness values
4 The location of the area is conducive to the perpetuation of wilderness values Consider the relationship of the area to sources of noise, air, and water pollution, as well as unsightly conditions that would have an effect on the wilderness experience The amount and pattern of federal ownership is also an influencing factor

5 The area contains no more than a half-mile of improved road for each 1,000 acres, and the road is under Forest Service jurisdiction
6. No more than 15 percent of the area is in non-native, planted vegetation
7 Twenty percent or less of the area has been harvested within the past 10 years
8 The area contains only a few dwellings on private lands and if the location of these dwellings and the access needs insulate any effects on the natural conditions of federal lands

rotation -- the period of time between the initial timber stand establishment and the time when it is considered ready for cutting and regeneration

salable minerals -- common varieties of rocks including building stone, surface rock, sand, gravel, etc., of which no special or unique value is assigned Common examples are sandstone, granite, and shale

salvage cut -- a cut made to utilize trees that have been killed, damaged or degraded by fire, ice, windstorm, insect or disease attack, or drought

sanitation cut -- a cut made to prevent the spread of insects and disease from infested and infected trees to healthy trees Often administratively referred to as salvage cut

scoping -- process used by the Forest Service to find out what the public issues are and how the public feels about a specific action or project

seed tree harvest -- a pine regeneration cutting method where about 6-16 sawtimber size trees per acre are left to provide a seed source for natural regeneration

semi-primitive motorized -- a classification of the Recreation Opportunity Spectrum (ROS) characterized by a predominantly unmodified natural environment in a location that provides good to moderate isolation from sights and sounds of man

semi-primitive non-motorized -- a classification of the Recreation Opportunity Spectrum (ROS) Of all ROS classifications, SPMN land is the most remote and distant from the sights and sounds of human activities; offers abundant opportunities for solitude and serenity, allows no roads, no motorized use of trails by the public, there may be motorized use of trails for administrative purposes, emphasizes self-reliance, challenge, and risk; remains the most natural in appearance

sensitive species -- those plant and animal species identified by the Regional Forester for which population viability is a concern as evidenced by significant current or predicted downward trends in (a) population numbers or density, or (b) habitat capability that would reduce a species' existing distribution.

seral -- a biotic community which is a developmental, transitory stage in an ecologic succession

shelterwood cut -- a method of establishing a new stand by gradually removing the existing trees so that new seedings or sprouts become established under the protection of the remaining trees Normally, this is done in two separate harvests over a 5-year to 10-year period

single tree selection cut -- a cut that removes individual mature or immature trees based on their age, merchantability, health, seed production capability, and potential to increase in volume and quality In mixed stands it leads to an increase in the proportion of shade-tolerant trees

silviculture -- the theory and practice of controlling forest establishment, composition, structure, and growth Harvesting methods which begin the establishment of the next stand are followed with intermediate treatments such as thinning or weed control to create silvicultural systems

site index -- a measure of relative productive capacity of a site based on the height of the dominant trees in a stand at an arbitrarily chosen age, most commonly 50 years in the East

site prep (preparation) -- removal of unwanted vegetation, slash, roots, and stones from a site before reforestation.

site productivity -- Site productivity affects all plants, not just trees Generally, the higher the productivity, the more diverse the site is in terms of vegetation Overall, moisture relationships are a key factor in determining site productivity. Other factors are the depth, texture, permeability, fertility, moisture and drainage of the soils and the position and aspect of the topography

skyline corridors -- a term used in cable yarding to describe the pathway of the cable that is stretched between the yarder tower and the tail tree, along which logs are moved by a carriage that rides on the cable

slash -- woody material left after logging, pruning, thinning, brush cutting, or other management activities and/or accumulating there as a result of storm, fire, or other damage

social encounters/solitude -- refers to the number and type of other people met along Forest travelways or camped within sight or sound of others This setting indicator measures the extent to which the Forest provides experiences of solitude.

special interest area (SIA) -- a unit of public land that is protected by a federal agency because of the area's unique features such as geological formations, cultural values, zoological or botanical attributes

special stipulation -- a type of stipulation or condition attached to a federal oil and gas lease limiting use of the surface in some specific way

species -- organisms that successfully reproduce among themselves and cannot reproduce successfully with other organisms

stand type -- a contiguous group of trees sufficiently uniform in species composition, arrangement of age classes, and condition to be a homogeneous and distinguishable unit

stringers -- narrow strips, usually less than 5 chains (330 feet), of trees left uncut, normally along streamcourses

system roads -- roads on the Forest are comprised of roads under jurisdictions of the Forest Service and the states of Virginia and West Virginia Roads under Forest Service jurisdiction are called Forest Development Roads and are often referred to as "system" roads

succession -- a natural process in which plants of greater shade tolerance gradually replace those that are intolerant of shade This process is constantly changing as numerous events, both natural and man-caused, occur

suitable forest land -- those lands which will be managed for timber products under long-term sustained yield

tank trap -- a method used to close a road by constructing an earthen berm across the road The berm is high enough and shaped so that vehicles can not travel over or around it

temporary roads -- any short-lived road not intended to be a part of the Forest development transportation system and not necessary for future resource management

tentatively suitable -- refers to the suitability of land for timber production Tentatively suitable indicates land that is physically suitable for timber production and that has not been congressionally or administratively withdrawn from consideration for timber production Refer to Appendix A of the Revised Plan for a breakdown of suitability classifications

thinning -- a cut that fells or removes surplus trees thereby reducing competition and increasing the growth and quality of remaining trees

threatened species -- any species of plant or animal which is likely to become endangered within the foreseeable future throughout all or a significant portion of its range.

timber sale program quantity -- includes the allowable sale quantity for the first decade and any additional volume of timber planned for sale during the first decade Normally, this additional volume includes salvage from land classified suitable for timber production and from land classified unsuitable

timber stand improvement -- includes treatments made in a stand of trees such as thinning, release, weeding, or pruning The treatments may increase the proportion of commercial species or improve growth rate or quality of residual trees

tolerance -- term for expressing the relative capacity of a tree to compete under low-light and high root competition Tolerant species reproduce and form understories beneath canopies of less tolerant trees or even beneath their own shade Intolerant species reproduce successfully only in the open or where the canopy is greatly broken

tolerant species -- species that reproduce and form understories beneath canopies of less tolerant trees or even beneath their own shade

traffic service level (TSL) -- the significant traffic characteristics and operating conditions for a road GW roads are classified as Level A, B, C, or D See Appendix G of the Plan for details

trail bike -- a motorcycle manufactured primarily for off-highway use Trail bikes generally do not have the equipment necessary to be licensed by the state for use on developed roads

trail-heads -- the point at which a trail begins

understory -- herbaceous species, trees, and other woody species growing under a more-or-less continuous cover of branches and foliage formed by the upper portion of adjacent trees and other woody growth

uneven-aged management -- a timber cutting system that regulates the number and sizes of trees to be left standing in an area being cut Goals of the system are to maintain continuous high-forest cover, to regenerate desirable species, and to provide a sustained yield of forest products by the orderly growth and development of trees of a variety of diameter and age classes Cutting methods that develop and maintain uneven-aged stands are single-tree selection and group selection

unfragmented habitat -- large blocks of land with continuous habitat characteristics such as canopy cover

unsuitable forest land -- forest land that is not managed for timber production because (a) the land has been withdrawn by Congress, the Secretary, or the Chief, (b) the land is not producing or not capable of producing crops of industrial wood, (c) technology is not available to prevent irreversible damage to soils, productivity, or watershed conditions, (d) there is no reasonable assurance that lands can be adequately restocked within five years after final harvest, based on existing technology and knowledge, as reflected in current research and experience, (e) there is at present a lack of adequate information in response to timber management activities, or (f) timber management is inconsistent with or not cost efficient in meeting the management requirements and multiple-use objectives specified in the proposed Forest Plan

visual quality management -- management of the visual resource -- the quality of the landscape

visual quality objective -- the degree of acceptable alteration of the landscape The system contains four categories of landscape management· preservation, retention, partial retention, and modification When one of these categories is assigned to an area of the Forest, any changes made in the appearance of that area must be in line with the assigned category The preservation category allows no man-caused changes in the landscape At the other end of the scale, modification allows man's activities to be dominant features in the landscape.

wetland -- areas that are inundated by surface or ground water with a frequency sufficient to support a prevalence of vegetation or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction Wetlands generally include swamps, marshes, bogs, and similar areas such as sloughs, potholes, wet meadows, river overflows, mud flats, and natural ponds (very poorly drained soils are associated with wetlands)

whole tree harvest -- the removal of all above ground parts of the tree from the site Usually this is associated with chipping the entire tree at the landing and removing the chips

wilderness -- areas designated by Congress where natural processes are allowed to operate freely and man is a visitor who does not remain

wildlife corridor -- continuous habitats that link larger similar areas

wildlife stand improvement -- vegetation manipulation for the benefit of wildlife Methods include overstory thinning and prescribed burning to promote growth of understory for wildlife food and cover, planting soft or hard mast shrub or tree species, grasses, and forbs for food, or providing suitable conditions for animals -- such as insects -- which are in themselves a food source

wildlife-user days (WUD) -- a unit used to measure the amount of use the public gets from the Forest A wildlife-user day represents one person hunting or viewing wildlife for a period of 12 hours

wildland-urban interface -- development close to a boundary shared by national forest and private land owner

working groups -- a method used to classify vegetation for the purposes of timber management The GWNF uses four working groups· upland hardwoods, cove hardwoods, white pine, yellow pine